DOCUMENT RESUME

ED 413 872 IR 018 622

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|---|---|
| AUTHOR | Moran, Barbara B. |
| TITLE | Preparing Tomorrow's Health Sciences Librarians: Feasibility and Marketing Studies. Final Report. |
| INSTITUTION | North Carolina Univ., Chapel Hill. School of Information and Library Sciences. |
| SPONS AGENCY | National Library of Medicine (DHHS/NIH), Bethesda, MD. |
| PUB DATE | 1997-09-00 |
| NOTE | 233p. |
| CONTRACT | 1-T15-LMO7113-01 |
| PUB TYPE | Reports - Descriptive (141) |
| EDRS PRICE | MF01/PC10 Plus Postage. |
| DESCRIPTORS | Curriculum Development; *Curriculum Evaluation; Educational Objectives; Educational Quality; Information Science Education; *Library Education; Library Schools; Lifelong Learning; *Medical Libraries; Medical Research; Models; *Professional Training; Program Evaluation; *Relevance (Education); Surveys |
| IDENTIFIERS | Grant Recipients; Health Sciences; National Library of Medicine MD; University of North Carolina Chapel Hill |

ABSTRACT

With the support of a planning grant from the National Library of Medicine, the University of North Carolina at Chapel Hill (UNC) School of Information and Library Science (SILS), in collaboration with the UNC Health Sciences Library and the Program in Medical Informatics, evaluated five curricular models designed to improve education for health sciences librarianship. These models fit into a continual learning process from the initial professional preparation to lifelong learning opportunities, with the aim of enabling health sciences librarians to respond to their evolving roles in a rapidly changing environment. Three of the models enhanced existing degree and certificate programs in SILS with a health sciences specialization, and two were new programs for working information professionals. The study conducted data collection and analysis through feasibility and market studies to determine the potential success of each of the five approaches. Models were developed for each of the programs with input from experts and a Delphi study, the marketability of the models was tested through surveys of potential students and employers, and recommendations were made as a guide to implementation. Appendices comprising more than half the document include: rosters; expert advisory group meeting; expert interviews; Delphi study round one; Delphi study round two; market surveys of applicants, paraprofessionals, mid-career professionals, and employers; student focus group questions; program proposals; course offerings; and budget report. (Author/SWC)

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# Preparing Tomorrow's Health Sciences Librarians

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# Preparing Tomorrow's Health Sciences Librarians

University of North Carolina at Chapel Hill

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# PREPARING TOMORROW'S HEALTH SCIENCES LIBRARIANS:

# FEASIBILITY AND MARKETING STUDIES*

# FINAL REPORT

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September, 1997

*Funded by National Library of Medicine education and training planning grant 1 T15 LMO7113-01

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## EXECUTIVE SUMMARY AND RECOMMENDATIONS

With the support of a planning grant from the National Library of Medicine, the University of North Carolina at Chapel Hill (UNC) School of Information and Library Science (SILS), in collaboration with the UNC Health Sciences Library and the Program in Medical Informatics, evaluated five curricular models designed to improve education for health sciences librarianship. These models fit into a continual learning process from the initial professional preparation to lifelong learning opportunities, with the aim of enabling health sciences librarians to respond to their evolving roles in a rapidly changing environment. Three of them enhanced existing degree and certificate programs in SILS with a health sciences specialization, and two were new programs for working information professionals.

The following programs, each with a health sciences specialization, were included in the study:

- Master of Science degrees in Library and Information Science (MSLS and MSIS)
- Certificate of Advanced Study (CAS)
- Doctor of Philosophy degree (Ph.D.)
- Executive Certificate of Advanced Study (ECAS)
- Advanced Internship Program (AIP).

The study conducted data collection and analysis through feasibility and market studies to determine the potential success of each of the five approaches. Models were developed for each of the programs with input from experts and a Delphi study, the marketability of the models was tested through surveys of potential students and employers, and recommendations were made as a guide to implementation.

The models described, for each approach, the target audience and program objectives, prerequisites, academic and experiential program content, structure, delivery method, costs, and credential awarded. Across the programs, the data supported the inclusion of experiential content such as a site-related project, internship or field experience, or research practicum; a flexible structure; and focus on content tailored to individual needs. A core of academic content important for all the programs included: design and evaluation of information services and programs; health care environment; and creation, management, and use of health information systems.

Marketing data showed strong interest in a health sciences specialization from potential students in the master's program. In addition, the expert panels in the Delphi study rated the master's specialization as the most valuable in terms of contribution to the preparation of tomorrow's health sciences librarians. Mid-career professionals indicated the most interest in participation in the ECAS and AIP, among the post-master's programs, with the ability to maintain employment the most important factor in the decision to apply. Although respondents indicated that employer support for participation in the programs would be minimal, many employers stated they provide release time and/or funding for participation in relevant advanced degree programs. The Ph.D. with health sciences specialization received less backing in the market studies, but the expert advisory group rated it as the most valuable among the various approaches.

***Recommendations***

The central recommendation of the study is the adoption of a strategy of a center of excellence in health sciences information education. Implementation of this strategy would take place on several levels. To be most effective, leadership and coordination should occur on a national level. Through partnerships, local institutions can share in the development and provision of elements of a

virtual center of excellence. With its existing strengths and a commitment to building upon the results of this study, UNC is well positioned to play a leading role in working with others to advance a center of excellence and to implement local pieces of it..

The focus in health sciences information education at UNC would involve the implementation of all or parts of all the programs included in the study, in a sequenced phase-in recognizing the need to acquire support or develop partnerships. The results of the study indicated a perceived value in most of the potential programs and significant overall support for a health sciences specialization. The considerable overlap among programs would allow the development and packaging of course content and experiential opportunities, as well as faculty, to be used in more than one way, and it would be possible to integrate some of the programs.

- The National Library of Medicine has demonstrated initiative in health sciences information education through its long-range planning efforts and the awarding of the planning grants. We recommend that it continue to exercise a leadership role, through dissemination of results of the grants and implementation of recommendations resulting from them, willingness to work with partners to find ways to continue to support innovative educational programs, and adoption of a role in the strategy of a center of excellence.
- The study confirms the need for the Medical Library Association (MLA) to continue to provide leadership in lifelong learning for health sciences information professionals. We recommend that MLA play a role in addressing gaps in continuing education and foster collaboration among institutions on ways to facilitate professional development.
- We recommend that schools of library and information science institute elements of a center of excellence in health science information education and work together to make

opportunities fit overall needs and to facilitate access without geographic barriers. Results of this study will be disseminated to allow other institutions to apply them to their own settings with different possible actions. We recommend that UNC initiate and coordinate collaboration among schools.

UNC will also implement a number of initiatives which together will build a focus on health sciences information into its programs:

- The option of a health sciences specialization is recommended for the MSLS and MSIS degrees at UNC, with three required courses, two elective courses, and a practicum as requirements for the specialization, in addition to requirements for the general degree. One new course on the health care environment will be developed.
- No changes are recommended to the CAS program, as individual specializations are already allowed, although an expanded roster of health sciences courses will eventually be available.
- The Ph.D. program with a medical informatics minor will be marketed as part of the focus on health sciences. Completion of the core curriculum in medical informatics is required. As this option is in place, no changes are needed.
- It is recommended that SILS work toward offering an ECAS program for working professionals, combining on-campus and distance instruction. Initial steps include developing selected Web-based courses which can be offered both to on-campus students and to professionals at a distance, pursuing partnerships with other schools of information and library science and other UNC schools to offer an ECAS collaboratively, and seeking funding support.

- It is recommended that the Health Sciences Library investigate partners for the AIP, seek funding support, and develop options for internship experiences emphasizing the use of information in clinical settings and innovative uses of technology in library and information center environments.

# FINAL REPORT

## INTRODUCTION

The National Library of Medicine (NLM) awarded a one-year $65,600 education and training planning grant, 1 T15 LMO7113-01, "Preparing Tomorrow's Health Sciences Librarians," in October 1995 to the University of North Carolina at Chapel Hill (UNC) School of Information and Library Science (SILS). Subsequently, a no-cost extension for an additional year was approved. With the support of the grant, SILS, in collaboration with the UNC Health Sciences Library and the Program in Medical Informatics, evaluated five curricular models designed to improve education for health sciences librarianship. These models fit into a continual learning process from the initial professional preparation to lifelong learning opportunities. Three of them enhanced existing degree and certificate programs in SILS with a health sciences specialization, and two were new programs for working information professionals. Each of these approaches held opportunities to strengthen existing partnerships and meet goals shared by the School of Information and Library Science, the Program in Medical Informatics, and the Health Sciences Library and to develop alliances with related professional education programs.

The study set forth a two-phase data collection and analysis plan that included both feasibility and market studies to determine the potential success of each of the five approaches. Based on the existing educational programs and strengths of the university, the following programs were evaluated:

1. Master of Science degree in Library Science (MSLS) or Information Science (MSIS) with Health Sciences Specialization
2. Certificate of Advanced Study (CAS) with Health Sciences Specialization

3. Executive Certificate of Advanced Study (ECAS) with Health Sciences Specialization
4. Health Sciences Advanced Internship Program (AIP)
5. Doctor of Philosophy degree (Ph.D.) with Specialization in Health Sciences Information Management.

The goals of the study were:

1. to develop models for each of the five alternative approaches, with assistance from an expert advisory group and other individuals, and with refinement and development of the options using input from a Delphi study;
2. to test the marketability of these models, both to potential recruits and to potential employers, using a set of market surveys; and
3. to produce a report with recommendations about the feasibility of each of the five approaches, with the aim of being helpful to the broader health sciences education domain as well as being a guide to UNC for implementation of any of these programs.

**SIGNIFICANCE OF APPROACH**

This study aimed at addressing each of the goals outlined in *The Education and Training of Health Sciences Librarians* [1]. Through its planning efforts, it sought to improve the relevance of both the initial professional preparation and lifelong learning opportunities for health sciences librarians, so as to enable them to respond to their evolving roles in a rapidly changing environment. It also examined strategies to expand recruitment of new personnel into the field of health sciences librarianship. The needs and interests of potential and practicing health sciences librarians are quite diverse, as are the needs of employers. Therefore, the perspective taken in this study recognized that a variety of approaches would be needed to recruit new members to the profession and to retool those currently

in practice. At the master's level, the model was based on an attempt to identify what would constitute a health sciences specialization, and what would appeal to potential recruits and potential employers. At the post-master's level, the models were designed as well to respond to the particular constraints of practicing professionals, such as the need to maintain income and avoid relocation during training. The study attempted to correlate anticipated outcomes with each of the approaches. For example, a short-term internship program might appeal to a practicing librarian who is not working in a health sciences position but would like to consider moving into one, or to a health sciences librarian who needs an overview of innovative practices in a health sciences library or informatics setting, or to a new graduate who wants to refine a special skill or interest before moving into the job market. A certificate program combining academic course work with practical experience in a clinical information setting might appeal to a practicing health sciences librarian who needs evidence of newly mastered skills in order to advance within his or her organization. A doctorate with a specialization in health sciences information management should prepare graduates for leadership and research positions in health care organizations and institutions.

## OVERVIEW OF RESEARCH DESIGN AND METHODS

The goals of this study were to develop detailed descriptions of each of five alternative programs for educating health sciences librarians and researchers in health sciences information management, to test the market potential and market demand for each alternative, and to make recommendations concerning the implementation of the viable alternatives. To achieve these goals, planning was conducted in two phases. In the first phase, initial planning was undertaken and the feasibility of the initial plans was assessed. In the second phase, the market potential and market demand for those

plans were investigated. The results of these two phases were integrated in order to recommend the implementation of the most promising educational approaches.

The first phase began with the selection and meeting of an expert advisory group to provide guidance for the internal planning team. This group reviewed the initial descriptions of the educational models and the research design and methods of the study, and they provided input with particular emphasis on the two programs with which SILS had the least experience, the Executive Certificate of Advanced Study and the Advanced Internship Program. To test assumptions about these programs gained from the expert advisory group meeting, the internal planning team conducted interviews with selected information professionals and employers in the local area.

The next step was a Delphi study, which provided additional expert opinion to refine the descriptions of the models of the five educational programs. Based on the input from the expert advisory group and the interviews, a Delphi questionnaire listed content and design components of the educational programs. Three panels of experts, potential employers of health sciences librarians, practicing mid-career health sciences librarians, and the existing expert advisory group, agreed to participate. They rated each component on its importance to the relevant educational program and commented on the options. During a second Delphi round, panelists received feedback on responses from the first round and provided new ratings of the importance of each program component in order to move toward further consensus.

In the second phase of the study, three market surveys were conducted. The intention of these studies was to estimate the demand from employers for graduates of the five educational programs and to estimate the demand from potential students for enrollment in the programs. The importance of particular components within the planned educational programs was explored, as well

as potential barriers to enrollment and ways to overcome those barriers. The descriptions of the programs were based on the input gained from the Delphi study and other expert advice. One market survey was distributed to potential employers, asking them about numbers and type of professional staff, criteria considered in hiring staff, and support offered to staff for professional growth. The survey also described the planned educational programs and asked employers to rate the importance they would attach to completion of each of the programs and the likelihood of their supporting participation in them by their own staff. A second survey was distributed to applicants and potential applicants to information and library science schools, asking them about their interest in a health sciences specialization in the MSLS/MSIS programs, about factors which would influence their decision to enroll, and about how they would meet the costs of a program. A third survey was distributed to mid-career information professionals, asking them about their interest in the post-master's programs, factors which would influence their decision to apply, and potential employer support for participation. Demographic data was also requested from each of the potential student groups.

In addition to the market surveys, the planning team convened a focus group of SILS students enrolled in the health information resources course to discuss the potential health sciences specialization in the master's program. The purpose of the session was to elicit the students' perceptions of health sciences librarianship and their attitudes toward focusing their career options on such a specialization.

Finally, data from the two phases of the study were used in discussions about implementation of the programs and next steps for SILS in expanding its focus on education for health sciences librarianship. The programs aimed at working professionals required the most new resources and

development or repackaging of course content. Representatives from existing off-campus and distance delivery programs at UNC added insight on how they dealt with various resource, marketing, and curriculum issues. Potential partners in providing programs were consulted, and possible funding sources explored.

**PROGRAM DESCRIPTIONS**

The study began with preliminary descriptions of five educational programs, three SILS degree programs which already existed and could form the basis of specialized degrees emphasizing the health sciences and two additional models which were developed to be attractive to practicing health sciences librarians. The existing programs were the Master of Science degree (in Information Science and in Library Science), the Certificate of Advanced Study, and the Doctor of Philosophy degree. The new programs were the Executive Certificate of Advanced Study and the Advanced Internship Program. Each of these programs was different, and each could serve potential health sciences professionals and prepare individuals to work in various career tracks and environments.

***The Master of Science.*** SILS currently offers two master's degrees: a Master of Science in Library Science and a Master of Science in Information Science. The degrees are similar, sharing several required courses. The professional focus of the students and the electives they choose to take are the primary differences. Students from both programs are often enrolled in the same courses, enriching the classes with different perspectives and broadening the background and experiences that the students bring to their work and the classroom.

Unlike the vast majority of library and information science programs today, the SILS degrees require forty-eight semester hours of course work. It is this additional time beyond the standard thirty-six hours seen in most master's programs that allows students to go beyond core disciplinary

requirements. The "extra" twelve credit hours facilitate some specialization and a much better opportunity to work hands-on with today's rapidly expanding and evolving information technologies. While students may graduate with differing career paths, either one of these degrees could accommodate a concentration in health sciences information.

The MSLS with a concentration in health sciences could prepare students for professional employment in health sciences libraries and health-related information agencies and organizations. The preliminary description anticipated that in order to obtain this degree, students might be required to take courses such as science information, health sciences information, telecommunications, Internet applications, or introduction to medical informatics, in addition to the standard curriculum, which includes courses in organization of materials, information resources and services, resource selection and evaluation, communication processes, and research methods.

The MSIS with a concentration in health sciences could prepare students for professional employment in information agencies and organizations affiliated with the health sciences. In addition to the standard curriculum, which includes courses in information retrieval, systems analysis, organization of information, communication processes, and research methods, students might also be required to take other courses, such as science information, health sciences information, Internet applications, introduction to medical informatics, and/or information management in health policy and administration.

The preliminary description also assumed an experiential component to the content of the degrees. Students in either master's degree program might be required to enroll in a field practicum at an Area Health Education Center (AHEC) or at UNC Hospitals, to get exposure to the provision of information in educational and clinical environments. Other nearby practicum sites could include a

pharmaceutical company, a government-sponsored health research agency, or a health maintenance organization (HMO).

***The Certificate of Advanced Study.*** The CAS in Library and Information Science is a post-master's program designed for practitioners who seek an articulated and systematic continuing education program to enhance their professional career development. The CAS is designed to provide the opportunity to develop a specialty in a subject discipline, redirect a career path, or enrich and strengthen demonstrated capabilities of an individual's career. Many students use the CAS to update their technology skills. The CAS offers opportunities to develop leadership skills as well. It was envisioned that many of the students in a CAS with health sciences specialization would be employed in health sciences environments and would be returning to school to improve their skills, especially in the technology areas. It was hoped that this CAS program would also attract graduates who are interested and willing to extend their education for an additional thirty credits.

The current CAS consists of thirty semester hours of graduate-level course work, selected from the school's curriculum and other departments and schools of the university on the basis of the individual's needs and objectives. The program is tailored to an individual's previous education, experience, and career intentions and so can be designed with a focus on health sciences librarianship. Students in a specialized CAS could select ten courses from the roster of SILS course offerings such as science information, health sciences information, and telecommunications, as well as courses such as introduction to medical informatics or information management in health policy and administration. Also, depending on their professional background and goals, students might be encouraged to enroll in a field practicum in a health sciences information environment.

***The Ph.D.*** It was expected that the current SILS Ph.D. program would be used as a basis for developing the program for a Ph.D. with a specialization in health sciences information management. Its purpose is to educate scholars who are capable of addressing problems of scholarly consequence in the field of information and library science. Interdisciplinary programs are encouraged, and current combinations include associations with education, computer science, business, and social science. The program in health sciences information management would build upon linkages with the UNC Health Sciences Library, the Medical Informatics Programs in the UNC School of Medicine and at Duke University, and the UNC School of Public Health.

During the current program, students are required to take a minimum of thirty-six hours of course work, exclusive of the dissertation. Required courses include a seminar in information retrieval, a seminar in communication, and two semesters of statistics. In addition, they are encouraged to take at least one research practicum, an advanced research methods course, and a theory development course. Again, this course work would be appropriate for those emphasizing health sciences information management. In addition, they might be expected to take a practicum in health sciences information management and/or to conduct research related to health sciences information management. It was expected that dissertation topics would address the "new forms of information, new users, and new practice patterns that may be required for health sciences librarianship" [2].

***The Executive Certificate of Advanced Study.*** The ECAS model would provide a certificate of advanced study to health sciences information professionals who are unable to leave full-time positions to get the education they need. Students enrolling in this program would already have a master's degree. It was assumed that most of the participants would already be working in the field

of health sciences librarianship, but would be individuals who want to update or expand their knowledge or who want to prepare for an administrative position. Some participants might be working in professional positions in other types of libraries. Others might hold professional graduate degrees in a health discipline, such as public health, without the master's in librarianship.

The preliminary description called for the ECAS program to provide, in a non-traditional manner, a combination of work on campus and at other locations and of academic course work and exposure to working environments and leaders in the field. It would provide opportunities for experienced practitioners to enrich and strengthen existing capabilities, develop a subject or functional specialty, redirect a career path, or prepare for an executive position. It would use a mix of brief intensive courses taught at Chapel Hill combined with the use of the Internet as a means of maintaining contact and working on collaborative assignments in the period when the students were not on campus.

Students would be selected for the program as part of a cohort. The program would consist of both on-campus and off-campus learning experiences. The students would be required to come to Chapel Hill for some intensive classes especially designed for the adult working learner. The content of the classes would be drawn from the current SILS curriculum, but courses would be compacted so that they could be completed much more rapidly. In addition, classes would be designed to provide concentrated exposure to a clinical environment during an on-campus session. It is expected that these classes would be taught by faculty from the School of Information and Library Science, the Medical Informatics Program, the School of Public Health, and the Health Sciences Library.

Every attempt would be made to provide exposure to a health sciences library or information services environment for the ECAS participants. There are numerous health sciences libraries in the

Research Triangle and in surrounding states which could provide settings for short-term internships and applied research projects. Many of these have created Integrated Advanced Information Management System (IAIMS) environments or begun IAIMS planning. Students who work and live at a distance might identify a library or information services setting close to home where a project could be carried out, with guidance from a UNC faculty member via the Internet and/or brief visits to campus. Since some individuals seeking the ECAS may wish to compete for advanced information management positions in their institutions or elsewhere, this program also should aim to expose participants to the key leaders in health sciences librarianship via visits or other means.

After each of the on-campus sessions, students would leave with assignments that they would complete in their home environments. Feedback on these assignments, plus additional assignments and feedback, would be provided using a World Wide Web (WWW) facility mounted on the SILS server. Readings otherwise unavailable to students could be mounted on the WWW page. The Internet would provide a means for the faculty and the students to keep in touch with each other. Student teams could communicate on Internet and complete joint projects electronically. Faculty members would be able to provide feedback and assessment by the same means. Since a number of courses in this program would focus on the use of the new information technologies in health sciences librarianship, it is appropriate that some of the course work be delivered by means of these same technologies.

***The Advanced Internship Program.*** An internship program would attempt to provide work site-based opportunities for experienced or new librarians. The AIP would be customized to meet the educational needs of the individual with flexibility in the choice of sites and environments; academic course work would not be required but would supplement the practical experience as appropriate.

The specific aims of the internship program would be: (1) to expose the intern to innovative practices in health sciences libraries and informatics arenas; (2) to provide hands-on experience in using the latest information technologies in various areas of information management, including clinical information management, education, research, and administrative areas; (3) to support practical experience with academic course work in areas selected by the intern to match individual professional development needs, drawing from curricula in SILS, the Medical Informatics Program, and/or other curricula at UNC; and (4) to foster the development of interns' research interests and experience in areas of health sciences librarianship/informatics. The preliminary description assumed that no formal degree or certificate would be offered.

Ideally, the assignments, while being responsive to individual academic and experiential needs, also would benefit health sciences libraries, hospital and medical school information systems offices, and other health-related information settings. Exposure to the clinical environment could also be an important component of an intern's program.

**ISSUES CONSIDERED**

Development of the models of the educational programs focused on the following issues: target audience, structure of the educational experience, academic and experiential content, resources required to deliver the program, and expected outcomes.

- The definition of the target audience included the motivation for participation, entrance requirements, and cohort size. The study provided an opportunity to determine whether practitioners in a related field, such as another of the health or information professions, might be recruited to obtain advanced information management skills.

- The structure of the program was designed to be appropriate for the audience. In the case of the programs for working professionals, the length, timing, and fees were particularly important to define.
- The potential academic content of the programs included courses and material from existing SILS and medical informatics courses packaged in new ways, as well as courses from other academic units and entirely new courses. The experiential content included clinical experience involving observation of health sciences professionals using and developing information. The method of delivery of the academic and experiential content incorporated current technologies and allowed working professionals to undertake off-campus follow-up or internships.
- The analysis of the resources required to deliver the programs was important to their feasibility; faculty, physical, and technological resources were considered. In particular, an understanding of the direct and administrative costs of new programs involving internships and distance delivery was needed.
- The expected outcomes of the programs included both the degree or certificate awarded, as well as program objectives and potential employment for graduates.

## METHODS AND RESULTS: INPUT FROM EXPERT ADVISORY GROUP

The expert advisory group, which included leaders in health sciences library and information services, health care and administration, and education in health sciences librarianship and informatics, was convened to provide guidance throughout the course of the project. The group met January 8-9, 1996, with the planning team; due to weather conditions, the on-site meeting in Chapel Hill was

supplemented by extensive telephone conference calls with all members. (See Appendix A for the rosters of members of the planning team and the expert advisory group.)

The views of the expert advisory group shaped the context of the educational programs and the description of the models. Several themes emerged from the meeting. The proposed alternatives for educating professionals were seen as part of a continual learning process to maintain a high level of expertise, necessary because of rapid changes in the information and health care environments. Future economic conditions will lead to greater diversity in an individual's career over a lifetime; and individuals will need to take more responsibility for adding new knowledge and skills in order to be marketable and to meet the complex demands of information management in all health-related environments. SILS, in partnership with other academic units and employers, has the potential to assume responsibility for sustaining as well as creating a work force. These concepts of individual responsibility, a continuum of learning, and a partnership among educational providers confirmed the principles in the Medical Library Association's educational policy statement [3].

The expert advisory group also urged that broad boundaries be established for the programs. Health sciences information management should be defined as encompassing all types of information, including patient data, clinical information, research data, and knowledge-based information. Although the programs meet different needs, a core set of knowledge and skills common to them all should be identified. Programs which attract persons from diverse information backgrounds can produce an enriched learning process and meet organizational needs for persons with broader skills and the perspective to provide leadership.

During the meeting, the group was divided so that discussions could focus on the components of one of two new potential programs, the Advanced Internship Program and the

Executive Certificate of Advanced Study. (Notes from the discussions are included in Appendix B.) The group continued to lend its perspective by participation in the Delphi study and comment throughout the progress of the project.

The group recommended modifying the study methodology by replacing the first of three rounds of the Delphi study with interdisciplinary focus groups of employers and mid-career information managers. This would serve the same purpose of eliciting suggestions about the AIP and ECAS while allowing greater dialogue. In order to accelerate the project timetable, the planning team later decided to conduct selected individual interviews with representatives of these categories of persons. The function of the interviews was the same as that intended for the focus groups.

**METHODS AND RESULTS: INPUT FROM EXPERT INTERVIEWS**

Members of the planning team conducted interviews with local information professionals and employers of health information professionals. The purpose of the interviews was to validate the vision of the educational programs and to help the planning team answer questions about the target audience, structure, content, and expected outcomes of the proposed new programs (ECAS and AIP). The five information professionals interviewed included two health sciences librarians, a hospital nursing informatics professional, a state public health staff person, and a records manager in a corporate setting. Two employers interviewed were the CEO of a community hospital and the former director of information services in a pharmaceutical company. (Appendix A includes names of persons interviewed.)

The interviews focused on what information managers need to know now and in the future in a changing health information environment, whether the proposed programs fit those educational needs, and opinions on specific aspects of the programs. (See Appendix C for information on the

interviews.) The experts agreed that information professionals need a combination of technical and personal skills to be successful in a changing and complex information environment. In addition to general and specific knowledge of technology, they believed that information professionals need to be able to manage people, to have team skills, and to communicate well in all ways, especially in their particular setting and with their management. One important aspect of communication was the ability to develop and advocate proposals. The answers of the librarians concerning important skills reflected their thoughts on the roles of librarians; they emphasized the need for knowledge about adult learning, ability to filter and package information, and political skills to justify and define services. Both the librarians and the records manager stressed the need for enhanced teaching skills. Subject expertise noted in the interviews included science background, understanding of clinical settings, business knowledge, public health, and, in general, understanding the environment and what questions to ask. Knowledge of specific technical areas was mentioned, including database searching, organization of materials, indexing, scanning, imaging and interfacing systems, online medical records, and telemedicine.

In discussion of the ECAS, the experts felt that the academic and experiential content should be appropriate to executive positions and include management, human resources, presentation skills, budgeting, technology evaluation, strategic planning, managed care environment, and electronic records management. A consensus emerged that brief on-campus requirements were feasible and that the overall length of the program also needed to be limited. The concept of incorporating assignments between the on-campus sessions was accepted. They recommended both flexibility and structure in the design of the program. Funding from employers for participation in the program was expected to be variable and difficult, with time off, flexible schedules, or professional development or

recertification support most likely. The implication was that the individual would need to be highly motivated and willing to make personal sacrifices in terms of time or money. The potential audience was seen as librarians wanting to update or gain skills, to make a transition between hospital and academic settings, or to move to management positions. The librarians interviewed felt the program should focus on librarians rather than other information professionals. A degree or certificate as an outcome of the program was not important to the experts, but they believed it might be to other employers.

The experts made similar comments in the interviews concerning the structure, funding, and outcomes of the AIP. The experiential content was considered most important, with emphasis on clinical experience and systems. The internship in a clinical setting would provide exposure to patient care and the experience of working directly with physicians and would emphasize values and expectations for what information is needed and how it is provided. The potential audience was considered to be librarians wanting different experiences or needing quick background for positions.

The input from the interviews, combined with the results from the expert advisory meeting, was used to develop features of the programs which could be rated through the Delphi study.

**METHODS AND RESULTS: DELPHI STUDY**

The Delphi study provided additional expert opinion to support the decision making related to the design and implementation of the five educational programs. In addition to a panel made up of the nine members of the expert advisory group, two other panels participated. A panel of twenty-six employers included academic health sciences library directors, hospital library directors, VA and government library directors, hospital administrators, corporate administrators, academic administrators, and public health officials. Another panel consisted of twenty-five mid-career

professionals, with categories of academic health sciences librarians, hospital librarians, systems librarians and information science professionals, and professionals in other settings represented. (Appendix A contains the roster of Delphi panelists.) Because of the small size of the panels, the emphasis in selection of participants was on information professionals with library or information science degrees in health-related jobs and their employers. It was anticipated that the feasibility and marketability of including students with other backgrounds in the programs could be examined by involving other groups in the marketing phase of the study. The criteria used for inclusion on the panels were peer recognition, demonstrated leadership, and expertise in the changing information environment. The planning team used nominations from the expert advisory group and suggestions elicited from the experts during their interviews in developing the list of panelists. Each panelist was contacted by a member of the planning team and agreed to take part in the study. In the small number of cases where a person declined or could not be reached, a replacement with comparable background was selected.

The Delphi study consisted of two rounds of surveys which asked for rankings of components of the five educational programs in the areas of program content (academic content and experiential content) and program design (prerequisites, delivery method, and structure). Open-ended comments were also invited. The aim of the second round was to bring the panelists to even closer consensus on aspects of the programs. It was organized in the same manner but omitted questions on which there was already clear consensus and options which had a low frequency of selection, and it added new questions and response options suggested on round one of the study. Second-round options were ordered by frequency of selection in round one, with the number of responses noted.

After pretesting the instrument, the first survey was sent to panelists June 6, 1996, with return requested by June 24, along with background information on the grant. Instruments were coded with an identification code to allow follow up on unreturned questionnaires and computation of results by panel. Responses were received from fifty-five of the sixty panelists (91.6%). The second survey was mailed August 19 with a return date of September 4, a summary of omissions from the questionnaire due to consensus was included. Round two had a similar response rate, fifty-four of sixty panelists (90%).

The results of the Delphi surveys were used to develop the models of the educational programs which were described in the market surveys. Some generalizations can be made across programs; panelists favored: the master's degree in library or information science as the prerequisite for the post-master's programs; experiential content such as a site-related project, internship or field experience, or research practicum; flexible structure such as part-time status and combination of on-campus and off-campus learning; the awarding of some sort of credential; and focus on content tailored to individual needs. There was some overlap among programs concerning academic content: design and evaluation of information services and programs; health care environment; and creation, management, and use of health information systems were highly rated in most or all of the programs with required academic content. There were also differences due to the focus of the programs. A summary of what was learned from the Delphi study by program follows. (See Appendix D for Delphi round one instrument annotated with full results; Appendix E contains round two instrument and results.)

***Master of Science Program.*** The two most frequently identified topics for the academic content of the master's degree with a health sciences specialization were: biomedical and health

sciences information resources, and design and evaluation of information services and programs. Other highly rated content areas were health care environment; creation, management, and use of health information systems; and users' information needs and information seeking behaviors. An internship or field experience providing practical knowledge of health sciences library or information center operations gained through field experience should be required, as well as a thesis or research paper as a final product. No additional prerequisites should be established for the health sciences specialization in the master's program, though previous course work in basic or health-related sciences and previous work experience in a health care setting were selected by slightly smaller numbers of panelists. Delivery should combine on-campus classes and off-campus, remote classes, and part-time student status should be an option. The specialization should not extend the current length of the master's program.

***Advanced Internship Program.*** The AIP should entail supervised work experience in either a health sciences library or information center or in health information systems operations. A special project should be a required part of the internship. A majority indicated that academic course work should also be a required part of the AIP, if so, the most essential area would be medical informatics. The prerequisite for the program should be a master's degree in library or information science. The AIP should be six months in length. A final report and a seminar should be required parts of the program. A partnership between an off-campus, site-based mentor and an on-campus faculty advisor should be in place. A certificate or other credential should be awarded upon completion of the program.

***Certificate of Advanced Study.*** The academic content of the CAS with a health sciences specialization should include: design and evaluation of information services and programs; and

creation, management, and use of health information systems. Other possible areas of course work include: advanced systems design and networking; advanced management skills; and health care environment. The course work in the CAS should be comprised of a common core of courses supplemented with courses to address individual students' interests and needs. Experiential content should entail a major site-related project in a health sciences information setting. The prerequisites for participation in the CAS should be a master's degree in library or information science and previous work experience in a library or information management setting. The delivery should be through a combination of on-campus classes and off-campus, remote classes, and part-time student status should be an option for CAS participants. The current length of the CAS should be maintained, and a certificate or credential should be awarded upon completion.

***Executive Certificate of Advanced Study.*** The most highly rated academic content areas were: advanced management skills and advanced communications and presentation skills. Additional areas of study could include: design and evaluation of information services and programs; health care environment; creation, management, and use of health information systems; and advanced systems design and networking. The experiential content of the ECAS should include a major site-related project in a health sciences information setting. Special projects could be either collaborative among students or individual projects. Site visits to health information settings in the participant's local area should be accommodated. The prerequisite for participation in the ECAS should be a master's degree in library or information science. It was assumed that participants would maintain their current employment. The consensus was that ten courses over a period of two years was the most desirable structure and that a combination of on-campus courses and off-campus, remote classes was appropriate. Of the yearly total of 510 hours expected for student time involved in instruction and

preparation, the options of 96 or 128 on-campus hours received an equal number of votes. On-campus time should be structured as periodic weekends, summer institutes, or a combination. Distance learning activities could include ongoing electronic discussions, scheduled teleconferences, and online assignments. Supervision should involve a collaboration of the off-campus, site-based mentor and a faculty advisor. A certificate should be awarded upon the completion of the ECAS program.

***Ph.D. Program.*** The most highly rated academic content area for the Ph.D. with a health sciences specialization was research skills. Additional areas of course work could include: medical informatics; design and evaluation of information services and programs; creation, management, and use of health information systems; and design, delivery, and evaluation of education in information management. A research practicum should comprise the experiential component of the Ph.D. program. The prerequisite should be the master's in library or information science. A combination of on-campus classes and off-campus, remote classes should be offered.

***Overall value of programs.*** Round two of the Delphi study also asked respondents to estimate the value of each of the five programs in terms of contribution to the preparation of tomorrow's health sciences librarians. Across all the panels, the master's program with a health sciences specialization was rated most highly (4.2 on a scale of 1-5, with 1 low value and 5 high value); the other programs received ratings between 3.6 and 3.9. However, there were differences among the three panels. The expert advisory group rated the Ph.D. program highest (4.4), followed by the master's program (4.0). The mid-career respondents ranked the master's program first (4.3), followed by the ECAS (4.0). The employer panel also put the master's program at the top (4.4), with the AIP second (4.2).

A few themes also emerged in the answers to open-ended questions in round two. Respondents recommended that the programs remain focused on providing academic and experiential content tailored to the needs of the individual student. Many respondents suggested a combination of delivery and scheduling options for the proposed ECAS program. In the overview of programs section of the questionnaire, many respondents expressed skepticism about the need for the full array of programs. However, others perceived that the choices would assist the mid-career librarian.

There were comments which noted a lack of distinction between the purposes of some of the programs. The planning team refined the objectives of each program to be included in the descriptions in the market surveys. In particular, the difference between the CAS and ECAS was clarified; the ECAS now focused on preparation for executive-level positions. Cost information for tuition and fees was also added to the descriptions.

**METHODS AND RESULTS: MARKET SURVEYS**

Based on the information refined by the Delphi study, the market surveys described the models of the proposed educational programs and sought to test the marketability with potential students and employers. Information gained from the market study was used to determine to what groups the programs would appeal, what factors needed to be addressed to implement programs, where resources would need to be acquired or redirected, and what programs should be implemented. After consulting with a marketing professor in the UNC School of Business, the planning team decided to focus in the samples on groups closer to the "purchase" decision, i.e., groups that would be knowledgeable and have convictions. These included persons in health sciences libraries and students interested in library and information science programs as well as persons in closely related

professions. However, it will be desirable to address long-term strategies to attract other potential students and mid-career professionals who may not be aware of careers in the health sciences library and information field.

Surveys were distributed to approximately 750 persons in stratified random samples. Variations of the survey were designed for several groups. Two surveys addressed the master's degree with health sciences specialization. One sample included recently accepted applicants to ALA-accredited North and South Carolina library and information science (LIS) programs (UNC, North Carolina Central University, and University of South Carolina). The second survey went to health sciences library directors in the southeast (Region 2) of all academic libraries and a random sample of hospital libraries with at least one paraprofessional. The directors were asked to give the surveys to one or four (depending on the size of the library) paraprofessional staff members with a bachelor's degree and possibly with an expressed interest in a career in librarianship. Of the survey sent to applicants, 69 usable responses out of 126 surveys were received, for a response rate of 56.1%. (Three surveys returned with no forwarding address were deducted from the total.) Paraprofessionals returned 80 usable surveys out of 141 for a 56.7% rate.

Another survey, sent to mid-career members of various professional associations, covered the post-master's programs. Of the 250 persons in the sample, random samples of seventy-five each were drawn from Medical Library Association (MLA) and American Library Association (ALA) membership lists, fifty from American Health Information Management Association (AHIMA), and twenty-five each from American Society for Information Science (ASIS) and Special Libraries Association (SLA). Where possible, categories of members not likely to be mid-career professionals were eliminated. The AHIMA sample was restricted to members with at least a bachelor's degree and

with two to nineteen years of experience. Of the 250 surveys sent out (less 8 returned due to incorrect address or deceased recipient), 96 questionnaires were received, or 39.7%.

The final survey was sent to employers of health sciences librarians asking their reaction to all five programs. The sample was drawn from MLA institutional members, since this group is weighted toward the employers of the largest number of health sciences librarians (hospital libraries and academic health sciences libraries) while including a cross-section of types of organizations. Directors were asked to complete the survey, or, in the case of smaller libraries, asked to give it to an appropriate supervisor. The response rate was 39.4%, or 98 usable surveys out of 250 (less 1 due to deceased recipient). Of the completed surveys, 46 were from academic libraries, 46 from hospital libraries, and 6 from other categories.

Each survey was pretested. Duplications among samples were eliminated. Questionnaires were color-coded to facilitate sorting and identified with a code for follow up. Surveys were mailed January 2, 1997, with a requested return date of January 27. Reminder postcards were sent to all direct recipients of surveys. Persons were asked to respond with names of those to whom they forwarded questionnaires (health sciences library directors to paraprofessionals and MLA institutional members to supervisors), and reminder postcards were sent to the ultimate recipients as they were identified. In addition, employer non-respondents were contacted by electronic mail.

The response rates between 39.4% and 56.7% (with an overall response rate of 46.5%) probably reflect several factors which tended to lower returns. Portions of two surveys required the original recipients to identify appropriate respondents and give the questionnaires to them, a step over which the planning team had little control. Some of the records from which addresses were acquired were somewhat dated, since they came from application records or printed directories.

Several samples were made up of groups of persons who might not identify with health sciences librarianship. Some of the lists from which the mid-career sample was drawn were not coded to permit the exclusion of persons who would not be defined as mid-career. The questionnaires were fairly complex and ranged from four to twelve pages in length. Finally, the computation of the response rates was done in a conservative manner, counting refusals to participate for whatever reason as non-responses. Overall, the response rates seemed satisfactory and within the standard of the 40%-75% range for specific audiences [4].

The descriptive data proved to be more useful than the inferential data. Relationships tested included those between demographic data and responses, between pairs of responses, and differences in responses between sub-samples. Only a relatively few relationships were statistically significant but most were not valuable for interpretation. (Appendices F-I provide the instruments and results and analysis of the market surveys.)

***Master of Science Program.*** There was a strong interest in the master's degree with specialization among potential students (25% of applicants and 50% of paraprofessionals). Even if this result is overstated (in the case of paraprofessionals, they were already familiar with the health sciences library setting and may be interested in a professional career), this indication is meaningful. For applicants, geographic proximity to home and flexible schedule and availability of night courses were the most important factors when they made the decision about enrolling in a LIS program. Consistency of content with career goals and general reputation of the program were also highly ranked as very important factors. Among paraprofessionals, the most important factors in a decision to apply to a master's program with specialization would be availability of a part-time program and flexibility of schedule and availability of night courses. Consistency of content with career goals and

cost of program would also be highly ranked as very important factors. Most of the paraprofessionals who rated teaching reputation of faculty as most important were interested in applying to a health sciences specialization. A combination of sources of support for meeting the costs of the program was cited by both groups. (Appendices F-G contain complete data.)

***Post-Master's Programs.*** Mid-career respondents expressed the most interest in the ECAS (24%) and the AIP (23%). Although statistical significance was not achieved, the data suggest that AHIMA, ASIS, and MLA sample members were more likely to be interested in the ECAS than were members of the ALA and SLA samples. AHIMA respondents, in particular, were more interested in the ECAS (35%) than might be anticipated since they likely did not have LIS degrees. Across programs, the ability to maintain employment was the most important factor which might influence the decision to apply to a program. Little support from employers was anticipated; the highest expectations were for partial tuition and unpaid time off for the participation in the ECAS program and partial tuition for the AIP. Respondents were asked the maximum dollar amount they might contribute to their own support, given their interest in a program and the estimated cost. (See Appendix H for further data.)

***Employers.*** The most important criterion considered by employers in hiring professional staff now and over the next five to ten years was personal traits, such as flexibility, initiative, willingness to change, and communication skills. Other important factors were graduate LIS degree and previous work history. A graduate LIS degree with health sciences specialization was more important to employers in anticipating recruitment in the future than it had been when hiring current staff. In terms of support, employers were most likely to provide assistance for on-the-job training and attendance at conferences and continuing education courses. Over a third of the respondents

provided release time for participation in relevant advanced degree programs (38%) and/or funding (37%). They could envision providing periodic time off over a longer period for professional growth (58%). When evaluating the value of each of the five programs, the respondents were slightly more likely to support participation by staff members in the AIP and ECAS. The category of employer and size of staff had some statistically significant effect on the willingness to support participation in professional development and on the type of support. More academic employers provided release time for degree programs, while more hospital employers offered funding for degree programs. Employers with larger staffs were more willing to support participation in the AIP, ECAS, and Ph.D. programs. (See Appendix I for full results.)

**METHODS AND RESULTS: INPUT FROM STUDENT FOCUS GROUP**

A focus group of eight current UNC SILS students in the master's program were invited and compensated to meet in November 1996 to discuss their perceptions of health sciences librarianship. Gollop and Cogdill of the planning team facilitated the discussion. These students had demonstrated an interest in the field by enrolling in the class in health sciences information. The discussion centered on their interest in health sciences librarianship and how a specialization would affect their employment search, what a specialization should include, and where they expect to acquire knowledge and skills. (See Appendix J for the questions used to guide the discussion.)

The students were enthusiastic about the proposed specialization and expressed little fear that it would limit their employment prospects. A field experience in a health sciences setting emerged as an meaningful component in a specialization, and the students stressed the importance of having input in the design of projects performed as part of the experience. They raised the possibility of weekly seminars with speakers from the field as a potentially beneficial component, and they noted

the value of taking the more general course covering reference sources in the sciences. They also recommended that the program review and prepare them for membership in MLA's Academy of Health Information Professionals.

## METHODS AND RESULTS: INPUT FROM REPRESENTATIVES OF OTHER PROGRAMS

Representatives from existing UNC off-campus or distance delivery programs for health professionals met with the planning team. (See Appendix A for list of names.) The purpose of these exchanges was to learn more about how schools working within the same organization had resolved such questions as target audience, funding, marketing, scheduling, and curriculum development, which might also be relevant to SILS programs for mid-career professionals. Both the School of Nursing and the School of Public Health have successful programs in terms of market and revenue. Both experience demand from working professionals in their fields for continued education. Their off-campus programs are self-supporting and also generate revenue; they are priced by credit hour to the students. The Public Health program has a large marketing budget and recommended seeking grant funding during the start-up phase. They also are building affiliations with organizations to sponsor courses for their employees. Employers provide support for about 20% of the students in the program; the program strives to include projects and assignments which directly benefit the employing organization. The School of Nursing uses the university continuing education center to handle the administrative work. The representatives stressed the importance of including face-to-face interaction with faculty and other students in the programs and, in the case of Public Health, the value of the on-campus time. The Nursing program offers some courses through distance learning (teleconference and online); regular on-campus students and continuing education students at sites

throughout the state are integrated into existing courses. Both programs are offered to professionals in North Carolina, though public health also has a national program.

Since UNC's Program in Medical Informatics is a partner in the grant and medical informatics is an important component of academic content for the proposed programs, the director of the program made a presentation to the planning team of which he is a member. He reviewed the training program, including cooperative aspects with Duke University, NLM funding, students and faculty, interdisciplinary participation, research initiatives, core courses, and curriculum requirements. Cooperation between SILS and Medical Informatics offers potential for implementation of the educational programs which were studied.

The planning team also met with the executive director of MLA to discuss potential links between the association and this study. MLA is moving to an clearinghouse model for its support of continuing education. Functions will include publicizing information about available opportunities, facilitating access, quality control through the assignment of continuing education (CE) credits, and identifying gaps in continuing education. It is also initiating a self-directed learning program to encourage individual librarians to design their own learning projects, work with mentors, and receive CE credit for their work. MLA is interested in increased collaboration with LIS schools and has a potential role in a plan for educating and retraining professionals and in coordinating communication among involved parties.

**DEMOGRAPHIC INFORMATION**

The respondents in both the Delphi and market studies pointed to the importance of a flexible structure, such as the availability of part-time student status. UNC has not marketed its program to

the part-time student, in part because of the presence of such programs in the region. UNC ranked forty-fourth among fifty schools in the number of part-time master's students [5].

UNC's master's program draws a considerable number of its students from outside North Carolina; it is one of only four ALA-accredited programs with more out-of-state than in-state student enrollment [6]. Although the sample for the market survey testing student demand for the master's program was from the southeast, the largest current market for the school, there may be potential for a specialized program attracting a wide geographic pool.

## CONCLUSIONS AND RECOMMENDATIONS FOR IMPLEMENTATION

The planning team considered several paths as it reviewed the results of the study and considered how it could expand its educational programs in health sciences information. One option was to appraise the programs individually, weighing the relative feasibility and marketability as well as the fit with the goals of SILS.

A health sciences specialization in the master's program was met with strong interest from potential students. It would require fewer resources to implement than some of the proposed programs, principally the development and teaching of one or more new courses. It would also be possible to offer the option of a concentration to students in areas other than health sciences, with a comparable structure for numbers and types of required and elective courses.

Likewise, the existing doctoral program already lends itself to specialization according to the interests of the individual student, and minors in programs outside of SILS are already possible. It would be possible to build on the current relationship with the Program in Medical Informatics and market the opportunity to combine work in library and information science and medical informatics.

The existing CAS has had small enrollments, but the resources needed to maintain it are minimal. It would be possible to keep the existing CAS program and continue to allow students to develop their own package of courses, with possibly an expanded roster of health sciences courses for SILS programs from which to choose.

The ECAS would demand many new resources as a completely new program incorporating technology for distance learning, a schedule for working professionals, and the repackaging of existing course content as well as potential new courses. It might be possible to offer the same, or some of the same, courses to on-campus and ECAS students, but there would be considerable challenges. However, the study indicated a perceived value in such a program and potential demand. The program also fits the school's goal of integrating technology more into the delivery of courses. The university as a whole is also emphasizing making its education available to off-campus students and devoting resources to the use of technology in the curriculum. Although it would take longer to design the ECAS and secure outside resources, it also could have a greater impact.

The Advanced Internship Program would also require the development of a new program and additional resources. It is envisioned as a more individually focused program than the others and would compel the identification and oversight of each internship as well as overall coordination and faculty support.

A second strategy emerged as the desirability of the individual programs was compared. Instead of picking an individual program or programs to implement, SILS instead could adopt the strategy of a center of excellence in health sciences information education. The considerable overlap among programs would allow the development and packaging of course content and experiential opportunities, as well as possible new faculty, to be used in more than one way. It would also be

possible to integrate some of the programs. It would be much more feasible to offer some of the programs in partnership with other schools on campus or with other library schools. Implementation would occur in a sequenced phase-in recognizing the need to acquire support or develop partnerships.

The center of excellence in health sciences information education should take place on several levels. To be most effective, leadership and coordination should occur on a national level, by agencies such as the National Library of Medicine and the Medical Library Association. Through partnerships, local institutions can participate in a virtual center of excellence, sharing in the development and provision of elements of the center. UNC can play a leading role in working with others to advance a center of excellence. It can also begin to build the infrastructure of the center through implementing pieces of the center. UNC's role in a center of excellence would fit with the priorities of SILS, building on emergent strengths and an identified strategic focus. SILS has the advantages of a two-year master's program and a Ph D. program; an extensive roster of courses within the school and in other university units; access to relevant curricula in medical informatics, public health, and other disciplines; and availability of experiential opportunities in the Health Sciences Library and numerous information centers in clinical settings. The center of excellence would fill a need in the profession as well as give UNC a national focus. UNC is also well positioned to bring other organizations together to collaborate on a center of excellence.

A specialization is proposed for both the MSLS and MSIS programs at UNC. (See Appendix K.) Each would require five health sciences courses (three required courses and two electives) and a practicum, in addition to the basic core courses all students must take. The courses respond directly to the seven areas of knowledge and skills identified by the Medical Library Association [7] and

provide students with the foundation for a career in health sciences information. Required courses for the MSLS would be: science information (INLS 222), health sciences information (INLS 225), and health care environment (INLS 2xx, a new course). In addition a new elective on teaching and learning in the information environment is proposed. The MSIS would require health sciences information (INLS 225), health care environment (INLS 2xx), and introduction to medical informatics (BMME 170). Specific technology courses would not be prescribed, but students would be strongly encouraged to take those which fit their background and goals. Besides completing requirements for the core curriculum and specialization, students would be able to take three additional electives. (See Appendix L for course currently offered.)

The Ph.D. proposal (included in Appendix K) describes the specialization as the minor in medical informatics. The minor requires completion of fifteen credit hours including the core curriculum in the medical informatics program: introduction to medical informatics (BMME 170), medical information systems (BMME 171), research and evaluation methods in medical informatics (BMME 270), and clinical reasoning and decision making (BMME 271). The emphasis would be on preparation for research. Both the MSIS specialization and Ph.D. minor would necessitate agreement from the Program in Medical Informatics to admit larger numbers of SILS students in its courses. The planning team also encourages consideration of the designation of one NLM-funded fellowship for a SILS doctoral student.

Proposed requirements for admission to the ECAS program would be five years' professional experience with some in a health sciences setting. Computer competency and access to necessary technology for communication in the program would be required. The program would emphasize preparation for administrative positions and would combine short on-campus sessions followed by

independent study at the student's work site. (A possible program schedule and content are outlined in the proposal in Appendix K.) A model program as a collaborative effort among schools of library and information science who could share in course development, marketing, and campus time has potential for attracting external funding and would make implementation more feasible. The idea is being explored with potential partners who could offer expertise in health sciences content and distance learning.

The AIP also has potential for a model program involving collaboration with other institutions and external funding. Options are being developed for internship experiences emphasizing the use of information in clinical settings and innovative uses of technology in library and information center environments. Internships could possibly be integrated into the ECAS as the experiential component.

The initial phases of implementation will focus on students enrolling in an LIS master's program or who already have an MSLS or MSIS degree. Results from the study demonstrated consensus that this background was appropriate but also showed interest from professionals in fields other than medical librarianship. The expert advisory group also strongly recommended that an interdisciplinary cohort of students was desirable both for the educational experience and to meet the demands of organizations in the future. Long-range strategies should explore expanding recruitment of students from other fields, especially for the post-master's programs.

The National Library of Medicine has demonstrated initiative in health sciences information education through its long-range planning efforts and the awarding of the planning grants. It is hoped that it will continue to exercise a leadership role, through dissemination of results of the grants and implementation of recommendations resulting from them, willingness to work with partners to find

ways to continue to support innovative educational programs, and adoption of a role in the strategy of a center of excellence.

The Medical Library Association has provided leadership in lifelong learning for health sciences librarians. It too can be effective in a center of excellence by addressing gaps in continuing education and fostering collaboration among institutions on ways to facilitate professional development.

The data which has been collected in this study should be of assistance to these national agencies and to other LIS schools. Although UNC has used the results to make decisions about its own programs, the information is generalizable and can be applied to other settings with different actions possible. Data concerning desired components in educational programs, delivery methods, factors influencing a decision to participate in a degree or certificate program, and interest in different types of programs have been collected from a variety of perspectives and should be relevant in other educational contexts.

The results of the study support the need for more extensive education programs in health sciences information education both for entering students and working professionals. It demonstrates a demand for more specialized curricula and for retraining opportunities, especially for programs tailored to the requirements of individual students. It also suggests that employers can provide some support for professional development and that professionals in many cases are willing to take individual responsibility for further education. The study points to the opportunity for UNC and other partners to expand their role in helping health sciences information professionals meet changing and expanding roles.

## REFERENCES

1. NATIONAL LIBRARY OF MEDICINE. Planning Panel on the Education and Training of Health Sciences Librarians. The education and training of health sciences librarians. Bethesda, MD: National Institutes of Health, 1995.

2. IBID, 8.

3. MEDICAL LIBRARY ASSOCIATION. Platform for change: the educational policy statement of the Medical Library Association. Chicago: The Association, 1991.

4. POWELL RR. Basic research methods for librarians. 2d ed. Norwood, NJ: Ablex, 1991.

5. SINEATH TW, ed. Library and information science education statistical report 1996. Raleigh, NC: Association for Library and Information Science Education, 1996.

6. IBID, 168-9.

7. MEDICAL LIBRARY ASSOCIATION, op. cit., 4-7.

## APPENDICES

Appendix A: Rosters

Appendix B: Expert Advisory Group Meeting

Appendix C: Expert Interviews

Appendix D: Delphi Study Round One

Appendix E: Delphi Study Round Two

Appendix F: Market Survey: Applicants

Appendix G: Market Survey: Paraprofessionals

Appendix H: Market Survey: Mid-Career Professionals

Appendix I: Market Survey: Employers

Appendix J: Student Focus Group Questions

Appendix K: Program Proposals

Appendix L: Course Offerings

Appendix M: Budget Report

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Charles P. Friedman, Ph.D., formerly Professor, Department of Biomedical Engineering, UNC, Co-Investigator
Claudia J. Gollop, Ph.D., Assistant Professor, SILS, UNC
Helen R. Tibbo, Ph.D., Associate Professor and Assistant Dean, SILS, UNC
Barbara M. Wildemuth, Ph.D., Associate Professor, SILS, UNC
Margaret E. Moore, Head, Education Services, Health Sciences Library, UNC
Margaret L. Morrison, formerly Head, Reference and Access Services, Health Sciences Library, UNC
Stephen M. Downs, M.D., Director, Medical Informatics Training Program, Department of Biomedical Engineering, UNC
Keith Cogdill, Graduate Assistant
Carolyn E. Lipscomb, Project Coordinator

***Expert Interviews***

Martha Bedard, Director, Medical Library, Wake AHEC, Raleigh, NC
Glenn Burchett, Records Manager, Glaxo Wellcome
Ted Chapin, Chief Executive Officer, Chatham County Hospital, Siler City, NC
Kay Lytle, Clinical Nurse Education Specialist, Nursing Informatics, UNC Hospitals
Diana McDuffee, Coordinator, North Carolina AHEC Library and Information Services Network
Ildiko Trombitas, formerly Director, International Information Services, Burroughs Wellcome
Suzanna Young, Program Manager, Migrant and Refugee Health Programs, North Carolina State Department of Environment, Health and Natural Resources

***Delphi Panel: Employers***

Dr. Tom Bacon, North Carolina AHEC Program
Shelley A. Bader, Himmelfarb Library, George Washington University
Dr. J. Robert Beck, Baylor College of Medicine
Dr. Robert M. Braude, Cornell University Medical College
Alison Bunting, Louise Darling Biomedical Library, University of California, Los Angeles
Dr. Bruce Deighton, Memorial Medical Center, Savannah, GA
Dr. Don E. Detmer, Health Sciences Center, University of Virginia
Jacqueline Doyle, Health Sciences Library, Good Samaritan Regional Medical Center, Phoenix, AZ
Rick B. Forsman, Denison Memorial Library, University of Colorado
Lynn Fortney, EBSCO Subscription Services
Dr. Andy M. Friede, Information Resources Management Office, Centers for Disease Control and Prevention
Dr. John Glaser, Brigham and Women's Hospital
Kathryn J. Hoffman, Research Library, University of Texas, M. D. Anderson Cancer Center
J. Michael Homan, Mayo Medical Library, Mayo Clinic
Mary M. Horres, Biomedical Library, University of California, San Diego
Christiane J. Jones, Library Service, Department of Veterans Affairs, Biloxi, MS
Dr. Mark Kirshbaum, Children's Heath Care, Minneapolis, MN
Dr. Roz Lasker, New York Academy of Medicine
Dr. Nancy Lorenzi, University of Cincinnati Medical Center
Donald J. Lovasz, SSM Health Care System, St. Louis, MO
Judith Messerle, Countway Library of Medicine, Harvard Medical School
Lynn Kasner Morgan, Levy Library, Mount Sinai School of Medicine
Nancy K. Roderer, Cushing/Whitney Medical Library, Yale University
Bernie Todd Smith, Werner Health Sciences Library, Rochester General Hospital
Elizabeth Turner, Blue Cross Blue Shield of North Carolina
Dr. Marcia Zweerik, Merck and Co.

***Delphi Panel: Mid-Career Information Professionals***

Jennifer Bayne, Toronto Hospital Library
Martha Bedard, Medical Library, Wake Medical Center
Damon Camille, Houston Academy of Medicine/Texas Medical Center Library
Elizabeth Connor, Lyman Maynard Stowe Library, University of Connecticut
Ellen R. Cooper, Research Information Center, Solvay Pharmaceuticals
Kathie M. DeGeorges, Association of Womens Health, Obstetrics, and Neonatal Nurses
Marlene S. Englander, Library Services Department, Cleveland Clinic Foundation
Libby Evans, Carolina Population Center, UNC
Dr. Jacintha Kompella, Health Sciences Library, UNC
Susan S. Long, Medical Library, Kalispell Regional Hospital

November 27, 1995

«FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«Address2»
«City» «State» «PostalCode»

Dear «Title»:

I am very pleased that you have agreed to serve as a member of the Expert Advisory Group to the University of North Carolina at Chapel Hill's Planning Grant "Preparing Tomorrow's Health Sciences Librarians: Feasibility and Marketing Studies."

The meeting of the Expert Advisory Group will take place Monday, January 8 - Tuesday, January 9, 1996, in Chapel Hill. The meeting will begin at 9:00 am on Monday and end after lunch on Tuesday. We plan to meet on campus and will inform you of the exact location later.

We are able to reimburse you for travel expenses as well as pay you a small honorarium of $450. Please make your own plane reservations as needed; the Raleigh-Durham airport serves Chapel Hill. We have made hotel reservations for you at the Carolina Inn, (211 Pittsboro Street, Chapel Hill, NC 27516, - Phone: 919-933-2001) for Sunday and Monday nights. You may make any changes to your reservation directly with the hotel. The hotel room will be billed to the school. We will be happy to cover Saturday night as well in order to take advantage of airline ticket discounts if you would like to spend additional time in Chapel Hill.

The members of the Expert Advisory Group are leaders in health sciences library and information services, health care and administration, and education in health sciences librarianship and informatics. The group will provide guidance to the Internal Planning Team and the Project Coordinator throughout the course of the project. After your initial meeting in Chapel Hill at the beginning of the project, you will be asked to give feedback by electronic mail or other means. The grant is scheduled to be completed by September 30, 1996; due to a delay in initial funding, the period may be extended slightly.

The planning grant will explore the feasibility of new approaches to the preparation of health sciences librarians. The School of Information and Library Science, in conjunction with the Health Sciences Library and the Program in Medical Informatics, will examine five possible approaches: 1) Master of Science degree in Library Science or Information Science with a health sciences specialization; 2) Certificate of Advanced Study with a health sciences specialization, on site; 3) Executive Certificate of Advanced Study with a health sciences specialization, on and off site; 4) Postgraduate Internship Program with a health sciences specialization; and 5) Ph.D. degree with a Medical Informatics minor. Because the needs and interests of potential and practicing health sciences librarians are diverse, as

«FirstName» «LastName»
Page Two
November 27, 1995

are the needs of prospective employers, feasibility and marketing studies will ensure that the most appropriate programs are mounted to prepare health sciences librarians.

During Phase I of the project, the role of the Expert Advisory Group will be to advise on developing models for the content and structure of the five alternative educational approaches using input from a Delphi study. The group will assist with the development of the questionnaire and selection of respondents for the Delphi study, description of the programs, identification of new curriculum components, interpretation of the results, and preliminary assessment of the feasibility of implementing the programs. During Phase II of the project to test the marketability of the models, the group will participate in pilot testing of surveys, assist in evaluating the results and considering the desirability and feasibility of the programs, and comment on the final report.

Several documents are enclosed as background information:

- Roster of Expert Advisory Group and Internal Planning Team members
- Meeting Agenda
- Grant Application (A summary of the aims of the project is on p. 42-43; the five potential educational programs are described on p. 46-54 and the research design and methods on p. 54-66.)
- Excerpts from Review of Application.

A more detailed agenda and other documents to be discussed at the meeting will be sent to you later.

Thank you for your interest in participating. I look forward to seeing you on January 8. If you have any questions before then, feel free to contact me or the Project Coordinator, Carolyn Lipscomb.

Sincerely,

Barbara B. Moran
Principal Investigator
Dean and Professor, School of Information and Library Science

BBM/sgt

Enclosures

**Agenda**

**Expert Advisory Group Meeting**
**Librarian Education/Training Grant**
**University of North Carolina at Chapel Hill**

(Meeting locations are in walking distance of Carolina Inn)

**Monday, January 8, 1996**
**Health Sciences Library**
**(So. Columbia St., Rare Books Room, 2nd floor)**

| | |
|---|---|
| 9:00-10:30 | INTRODUCTIONS AND OVERVIEW (Moran) |
| 10:30-10:45 | BREAK |
| 10:45-11:15 | EDUCATIONAL PROGRAMS (Friedman)<br>Vision of Programs and Overview of Task |
| 11:15-12:45 | Program Design Exercises: Executive Certificate of Advanced Study and Advanced Internship Program |
| 12:45-1:45 | LUNCH (on-site) |
| 1:45-2:45 | EDUCATIONAL PROGRAMS (continued)<br>Presentation and discussion of program designs |
| 2:45-3:30 | DELPHI STUDY METHODOLOGY (Wildemuth) |
| 3:30-4:00 | BREAK |
| 4:00-4:45 | CRITERIA FOR SELECTION OF DELPHI STUDY PANELISTS (Jenkins) |
| 6:30 | DINNER<br>Home of Carol Jenkins<br>(Transportation will be provided from Carolina Inn) |

**Tuesday, January 9, 1996**
**School of Information and Library Science, Manning Hall**

| | |
|---|---|
| 8:30-9:45 | ENHANCEMENTS TO EXISTING EDUCATIONAL PROGRAMS (Friedman) |
| 9:45-10:00 | BREAK |
| 10:00-10:45 | DELPHI STUDY PANELISTS (Jenkins) |
| 10:45-11:45 | MARKETING STUDY METHODOLOGY (Lipscomb) |
| 11:45-12:00 | WRAP-UP (Friedman) |
| 12:00 | LUNCH (box lunches on-site) |

## SUMMARY OF DISCUSSION DURING CONFERENCE CALLS

### EXECUTIVE CERTIFICATE OF ADVANCED STUDY:

*TARGET AUDIENCE: Working professionals. Librarians, librarian "equivalents," others in health care industry, those with advanced degrees in natural or health sciences or MIS in business, scientists interested in information work. Could be unemployed. National recruitment.

-MOTIVATION: Need for understanding of world of information management plus specific needs related to career development or organizational context.

-PREREQUISITES: MLS or relevant professional degree; extensive professional experience may be substituted; relevant experience.

-COHORT: Diversity of participants; longitudinal experience of cohort.

*STRUCTURE OF EDUCATION EXPERIENCE: Differentiation from other institutions; possible collaboration with other institutions with common core offered at multiple sites and electives at specific sites; possible coordination with MLA professional development program.

-LENGTH OF PROGRAM/TIMING: Intense 2-3 week sessions vs. series of 1-week sessions (e.g. 6 sessions) vs. on-site updates (2-3 days each) at regular intervals. Assignments to be worked on off-site; augmentation with WWW, distance learning. One-year maximum total time.

-FEES: Compare with business school programs.

*ACADEMIC CONTENT: Focus on total information support for institution; content outside of traditional library sciences; research base; influence of managed care settings; revise frequently.

-AREA OF STUDY: Interdisciplinary, synthesis across disciplines. Technology, policy and planning, budgeting, finance.

-ADVISING:

-METHOD OF DELIVERY: Use technology; begin with retreat; team projects.

-REQUIRED VS. OPTIONAL: Standard core followed by electives.

*EXPERIENTIAL CONTENT:

*RESOURCES REQUIRED TO DELIVER: Collaborate with consortium of universities.

-FACULTY: Augment UNC faculty with visiting faculty; draw from international group; learners can also be teachers.

-PHYSICAL:

-TECHNOLOGICAL: Use in delivery and academic content; Internet access.

-OUTSIDE ASSISTANCE: Employer support- leaves of absence likely, tuition aid unlikely.

*EXPECTED OUTCOMES:

-DEGREE OR CERTIFICATE: Does certificate or continuing education system serve target audience?

-COMPETENCIES: Broad perspective and skills in information management; see also Academic Content.

-EMPLOYMENT: Information services, policy, planning; redefined roles in organization.

**ADVANCED INTERNSHIP PROGRAM:**

*TARGET AUDIENCE: New and experienced MLS, information specialists.
-MOTIVATION: Career change or advancement; opportunity for broader range of mentors; desire to learn what work experience has identified as important.
-PREREQUISITES: Advance degree in information field; broad definition.
-COHORT: Influenced by cost and length.

*STRUCTURE OF EDUCATION EXPERIENCE: Variable and flexible; contract with individual student. Internship might be part of MSLS with certificate awarded. Tracks could provide structure to flexibility.
-LENGTH OF PROGRAM/TIMING: Summer courses 2-4 weeks, followed by assignments and electronic communication; allow several options.
-FEES: Survey employers on willingness to pay.

*ACADEMIC CONTENT: Academic or experiential emphasis? Should there be list of knowledge and skills everyone should have? Different tracks with different cores?
-AREA OF STUDY: Core area is health sciences environment (e.g. academic health sciences environment, hospital social system, link between components, information transfer, clinical environment and information systems).
-ADVISING: Academic and site advisor necessary. Strong advisor/mentor/sponsor at work site.
-METHOD OF DELIVERY: Possible core set of videotapes.
-REQUIRED VS. OPTIONAL: Individualized and customized.

*EXPERIENTIAL CONTENT: Collegiality and interaction of cohort useful.
-AREA OF STUDY: Clinical information systems could be academic or experiential content.
-METHOD OF DELIVERY: Flexibility of location of practical internship; possibly individual's home institution; criteria for site selection. Individual responsibility for projects. Group work on projects possible; work with informatics students.
-REQUIRED VS. OPTIONAL:

*RESOURCES REQUIRED TO DELIVER:
-FACULTY: Academic and site advisors.
-PHYSICAL:
-TECHNOLOGICAL:
-OUTSIDE ASSISTANCE: Internship sponsor.

*EXPECTED OUTCOMES:
-DEGREE OR CERTIFICATE: Must have a deliverable. Must be certificate due to length of program.
-COMPETENCIES:
-EMPLOYMENT:

1515 Hermitage Ct.
Durham NC 27707
(919) 490-1611

March 11, 1996

Kenneth E. Rethmeier
Sun Health Alliance
4501 Charlotte Park Drive
Charlotte NC 28217

Dear Mr. Rethmeier:

I am writing to find out if you would be willing to participate in an interview about your perspective on information management. This interview is part of a process to develop new approaches to preparing health sciences librarians and information professionals to meet the challenges of information management in the future. We are conducting interviews with a small number of employers and professionals in the field, and we are particularly interested in your viewpoint as an executive in the managed care environment. Dr. Charles Friedman, Professor and Director of Medical Informatics Training at the University of North Carolina School of Medicine, will carry out the discussion with you by telephone, which should require no more than an hour. I will telephone you early next week to determine if you will be able to participate and to arrange a convenient time.

As background for the interview, I am including the following description of the project and the proposed programs.

**PROJECT SUMMARY**

The National Library of Medicine awarded a $65,000 grant to the University of North Carolina at Chapel Hill's School of Information and Library Science. During the one-year planning grant, the School will collaborate with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to better respond to their evolving roles in a rapidly changing environment. The project will examine both enhancements to existing degree and certificate programs in the School of Information and Library Science as well as new on- and off-site programs.

**OVERVIEW OF NEW PROGRAMS**

The project will examine the feasibility and marketability of two new programs in the School of Information and Library Science with a specialization in health sciences: an Executive Certificate of

Advanced Study and an Advanced Internship Program. These approaches attempt to respond to the needs of working professionals for continuing education with short intensive courses, experiential content, and alternative delivery methods.

The Executive Certificate of Advanced Study would include a combination of work on campus and at other locations and of academic coursework and exposure to working environments and leaders in the field. It would provide opportunities for experienced practitioners to enrich and strengthen existing capabilities, develop a subject or functional specialty, redirect a career path, or prepare for an executive position.

The Advanced Internship Program would provide a worksite-based internship to expose new and experienced professionals to practices and technologies in information management. The program would be customized to meet the educational needs of the individual with flexibility in the choice of sites and environments; academic coursework would not be required but would supplement the practical experience as appropriate. The program would provide the opportunity to develop expertise in a set of skills or a specialized area.

## METHODOLOGY

A meeting of experts in health sciences information management was held to gather advice on the development of new educational programs. Their views, supplemented by interviews with selected employers and mid-career professionals, will serve as the basis for a Delphi study to define the content and structure of the educational programs. Market surveys will be then conducted to estimate the demand from potential employers for graduates of the programs and the demand from potential students for enrollment in the programs. The final report will make recommendations on the implementation of the educational approaches.

## ENVIRONMENT

Several environmental trends influence the direction of educational preparation for health sciences information management. Current economic conditions and forecasts indicate that the career of an individual will be more diverse over a lifetime; individuals will need to take more responsibility for adding new knowledge and skills in order to be marketable and to meet changing demands. Organizations will require employees with broader skills and the perspective to provide leadership. The boundaries between the specialized functions of information management will blur due to the need for integrated information in organizations.

Within the context of these trends, the proposed educational programs are envisioned as focusing on health sciences information management defined as encompassing all types of information (including patient data, clinical information, research data, and knowledge-based resources). They should be interdisciplinary in program content and attract students from multidisciplinary fields including librarianship, information management, clinical health sciences, and public health. The programs will be

part of a continual learning process to maintain a high level of expertise required by rapid changes in the information and health care environments.

**YOUR INPUT**

The purpose of the interview with you is to solicit your views of the educational programs described above. Dr. Friedman will discuss with you your perspective on what information managers need to know now and in the future and what you expect the information environment to be. He is interested in knowing if the overview of the proposed programs fits your vision of the needs for information management. He will ask for your opinions on the target audience, structure, content, and desired outcomes of the proposed programs. Along with views from other sources, your input will be used to describe components of the programs to be evaluated by panelists of employers and information students and professionals.

Sincerely,

Carolyn E. Lipscomb
Project Coordinator

cc: Charles Friedman

**Interview guide**
Martha Bedard, 3/1/96

Overview of study; informed consent

What do information professionals need to know in the present and future?
How is the health information environment changing, and what are the implications of those changes?

***Executive certificate of advanced study***

Post-masters' degree; professional experience
Student goals: to enrich and strengthen existing capabilities, to develop a subject or functional specialty, to redirect a career path, to prepare for an executive position

What should be the academic content of such a program for health sciences information professionals?
How should the academic content be delivered?

Specific suggestions for the program?
Audience: who is likely to want to participate?
Structure: overall scheduling, balance between academic and experiential components
Funding: employer or student responsibility? fee structure?
Content: specific areas
Outcomes: certification of completion? educational outcomes?

Overall feasibility of program?

***Advanced internship***

Post-masters' degree; no professional experience necessary
Student goals: to develop expertise in a set of skills or a specialized area

Should there be an academic component to this program? If so, what should be its academic content?
How should the academic content be delivered?

What should be the experiential content of such a program for health sciences information professionals?
How should the experiential content be delivered?

Specific suggestions for the program?
Audience: who is likely to want to participate?
Structure: overall scheduling, balance between academic and experiential components
Funding: employer or student responsibility? fee structure?

Content: specific areas
Outcomes: certification of completion? educational outcomes?

Overall feasibility of program?

***Delphi study***

Suggestions for Delphi panelists?

«Prefix» «First» «Middle» «Last»
«Title»
«Organization»
«Address1»
«Address2», «State» «Zip»

Dear «Prefix» «Last»:

Thank you very much for agreeing to participate in the Delphi study for the University of North Carolina at Chapel Hill. We will find your perspective very valuable in determining the content and design of potential educational programs for health sciences librarians and information professionals.

As «Name» described to you, this questionnaire is the first of two you will receive. We would very much appreciate your returning this questionnaire by June 28; if this will not be possible, you may contact Keith Cogdill at cogdk@ils.unc.edu or (919) 966-3641. The code on the questionnaire will allow us to follow up on questionnaires not returned; responses will be anonymous during the analysis of data and reporting of results.

We are required to obtain your agreement on the enclosed consent form. Please send the completed questionnaire and consent form to:

Barbara B. Moran, Ph.D.
Principal Investigator
Dean and Professor
School of Information and Library Science
Campus Box No. 3360, 100 Manning Hall
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3360

FOCUS OF UNC GRANT

The National Library of Medicine (NLM) awarded a $65,000 grant to the University of North Carolina at Chapel Hill's School of Information and Library Science. During the one-year planning grant, the School is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine both enhancements to existing degree and certificate programs in the School (the Master's degree, the Certificate of Advanced Study, and the Ph.D. program), as well as new on- and off-site programs (the Executive Certificate of Advanced Study and the Advanced Internship Program).

«Prefix» «First» «Middle» «Last»
Page Two
June 7, 1996

A meeting of experts in health sciences information management was held to gather advice on the development of new educational programs. Their views, supplemented by interviews with selected employers and mid-career professionals, served as the basis for the construction of this Delphi questionnaire. Through this questionnaire, you are being asked to examine the initial plans for the content and design of five programs that may be offered by the School, each including a specialization in the health sciences.

BACKGROUND OF NLM GRANTS

The planning grant is one of several awarded by the National Library of Medicine in response to the need for health sciences librarians capable of applying the new information technology to biomedicine. The NLM Planning Panel on the Education and Training of Health Sciences Librarians identifies four priority areas for the awards: the evolving role of the health sciences librarian, professional education programs for health sciences librarians, lifelong learning programs for health sciences librarians, and broadening recruitment into health sciences librarianship.[1]

Braude notes that information technology is transforming the environment in which librarians work and changing the skills needed to function in that environment and that the characteristics of jobs in information management will determine the nature and type of education that should be acquired.[2]

The Medical Library Association (MLA) in its educational policy statement, *Platform for Change*, recognizes a continuum of learning occurring throughout a health information professional's career ranging from structured educational experiences to self-directed learning. It calls for individuals to assume personal responsibility for lifelong learning and for a coalition among educational providers--employers, MLA, schools of library and information science education, and NLM-- to explore new opportunities in the continuum of learning.[3]

The NLM Planning Panel report describes the current state of education for health sciences librarianship and sets out several goals, including the updating and enhancement of the curricula of schools of library and information science and new approaches for preparing health sciences librarians to assume new roles. It notes the importance of interdisciplinary coursework and the need to integrate experience in work settings into the curricula. It also calls for educational programs enabling health sciences librarians already in the workplace to update and extend their professional education and training, including through alternative methods and courses of study for adult learning.[1]

The project undertaken by the University of North Carolina attempts to build upon the work of these studies described above and to meet the goals set forth by them.

«Prefix» «First» «Middle» «Last»
Page Three
June 7, 1996

Thank you again for your willingness to provide your input. If you have any questions, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Professor
Principal Investigator

BBM/sgt

Enclosures

[1] National Library of Medicine. Report of the Planning Panel on the Education and Training of Health Sciences Librarians. Bethesda, MD: National Institutes of Health, 1995.

[2] Braude RM. Impact of information technology on the role of health sciences librarians. Bull Med Libr Assoc 1993 Oct; 81(4):408-13.

[3] Medical Library Association. Platform for change: the educational policy statement of the Medical Library Association, 1991.

CONSENT FORM

PREPARING TOMORROW'S HEALTH SCIENCES LIBRARIANS:
A DELPHI STUDY

You have been asked to participate in a Delphi study concerning the design of educational programs for health sciences librarianship and health information management. The study will be conducted in two rounds. In each of two rounds, scheduled to take place within the next six months, you will be asked to respond to a questionnaire, evaluating suggestions for specific educational components, rating them in terms of their importance and feasibility. Though the time required to respond to each questionnaire will vary widely, it should take you no longer than an hour in each case. The program suggestions will be reported to you anonymously, as your suggestions will be included anonymously in the second round.

Participation in the study is voluntary. You may withdraw your consent and withdraw from the study at any time. If you have any questions or concerns that arise in connection with your participation in this study, you should contact Barbara Moran at 919-962-8366. You also may contact the UNC Academic Affairs Institutional Review Board if you have questions or concerns about your rights as a research subject (contact Frances A. Campbell, Chair, AA-IRB Office, CB#4100, 300 Bynum Hall, UNC-CH, Chapel Hill, NC 27599-4100, 919/966-5625).

_____ _____

Date Signature

Delphi Survey:
Round One

**Program: Master's degrees in Library Science/Information Science with Health Sciences Specialization**

The Master's degree programs prepare students for professional employment in library service and the information industry. They will be compatible, in their general requirements, with the requirements of a non-specialized master's degree in library science/information science. It is expected that students in these programs will enter a career in health sciences librarianship and/or information management.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the M.S. in Library Science/Information Science with Health Sciences Specialization.

A. Academic content: The core curriculum for the Master's degrees in library science/information science consists of five introductory courses, one each in communication, information organization, information retrieval, systems design and evaluation, and management, in addition to a large number of electives. From the following general areas of knowledge, please circle FOUR that you consider MOST important to add to the required core for new master's degree candidates.

1. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
16 (29.1%)[1]

2. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
13 (23.6%)

3. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
17 (30.9%)

4. Biomedical and health sciences information resources (e.g., current and historical resources, print and electronic formats, courseware, consumer health information)
35 (63.6%)

---

[1]N=55

5. Creation, management, and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
29 (52.7%)

6. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
37 (67.3%)

7. Design, delivery, and evaluation of education in information management (e.g., instructional design, cognitive psychology)
18 (32.7%)

8. General knowledge of biomedical and health sciences (e.g., basic and clinical sciences, public health, allied health)
21 (38.2%)

9. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
28 (50.9%)

*Are there other areas of knowledge you consider important to the education of new master's degree candidates?*

B. Experiential content: Please circle ONE from the following experiential opportunities that you consider MOST important to the education of a new master's degree candidate.

1. Practical knowledge of health sciences library or information center *operations* gained through field experience
29 (52.7%)

2. Practical knowledge of health sciences information *systems* support gained through field experience
15 (27.3%)

3. Introduction to a health environment (e.g., health care delivery, biomedical research, or corporate setting) gained through field experience
9 (16.4%)

*Are there other types of field experiences that you consider important?*

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: The Master's degree requires a bachelor's degree in any discipline as a prerequisite. Please circle TWO additional prerequisites that you consider MOST important to the education of a new master's degree candidate.

1. Previous coursework in basic or health-related sciences
   32 (58.2%)

2. Bachelor's degree in basic or health-related sciences
   12 (21.8%)

3. Previous work experience in a health care setting
   31 (56.4%)

4. Previous work in a library
   18 (32.7%)

*Are there other prerequisites that you consider important?*

B. Delivery method: Please circle ONE of the following methods of delivering course content that you consider MOST desirable.

1. On-campus classes
   14 (25.5%)

2. A combination of on-campus classes and off-campus, remote (e.g., through World Wide Web-accessible) classes
   39 (70.9%)

3. Teleconferenced classes
   2 (3.6%)

*Are there other content delivery methods that you consider desirable?*

C. Structure: Please circle option a or b for the choice you consider MOST desirable for each of the following issues.

1. Length of program
   a. Current length of the program (16 courses)
      32 (58.2%)

   b. Expanded length (17-21 courses)
      22 (40.0%)

2. Student status
   a. Full-time student status required
      6 (10.9%)

   b. Part-time student status possible
      49 (89.1%)

3. Thesis or research paper as a final product
   a. Required
      29 (52.7%)

   b. Not required
      25 (45.5%)

*Are there other structural elements that you consider important?*

**Program: Advanced Internship Program**

The Advanced Internship Program would provide a worksite-based internship to expose new and experienced professionals to practices and technologies in health information management. The program would be customized to meet the educational needs of the individual with flexibility in the choice of sites and environments. It would provide the opportunity to develop expertise in a set of skills or a specialized area. The audiences for the Advanced Internship Program include new and mid-career professionals from a wide range of backgrounds.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or skills that would result from the Advanced Internship Program experience.

A. Experiential content: The Advanced Internship Program is intended to be flexible and to be tailored to the needs and interests of a particular intern. Given this flexibility, from the following list please circle THREE types of internship experience that would be MOST desirable for an internship in health sciences information.

1. Observation of health sciences library or information center operations
   3 (5.5%)

2. Supervised work experience in a health sciences library or information center
   49 (89.1%)

3. Observation of health information systems operations (e.g., in schools, hospitals, HMOs, corporate settings)
   9 (16.4%)

4. Supervised work experience in health information systems operations (e.g., in schools, hospitals, HMOs, corporate settings)
49 (89.1%)

5. Observation of health care environments in general (e.g., administrative and policy-making bodies)
14 (25.5%)

6. A special project
35 (63.6%)

*Are there other types of internship experiences you consider important?*

*Have you any suggestions for types of intern host sites?*

*Have you any suggestions for special projects?*

B. Academic content: Given the primacy of experiential content in an internship program, please indicate what area or areas of formal coursework you consider essential, if any.

Why?

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: Please circle THREE prerequisites that you consider MOST important to an internship in health sciences information.

1. General knowledge of biomedical or health sciences
30 (54.5%)

2. Master's degree in library or information science
46 (83.6%)

3. Master's degree in biomedical or health sciences
8 (14.5%)

4. At least one year of professional experience in a health sciences library or information management setting
28 (50.9%)

5. At least one year of professional experience in any health care setting
   21 (38.2%)

6. At least one year pre-professional experience in a library or information setting
   14 (25.5%)

*Are there any other prerequisites you consider important?*

B. Structure: Please circle ONE option for the choice you consider MOST desirable for each of the following issues.

1. Length of program
   a. 2 months
      4 (7.3%)

   b. 6 months
      24 (43.6%)

   c. 9 months
      7 (12.7%)

   d. 12 months
      20 (36.4%)

2. Advisor or mentor
   a. On-campus faculty member
      10 (18.2%)

   b. Off-campus, site-based mentor
      46 (83.6%)

3. The award of a certificate or credential upon completion of the program is important?
   a. Yes
      48 (87.3%)

   b. No
      6 (10.9%)

*Are there other structural components you consider desirable?*

**Program: Certificate of Advanced Study (CAS) with Health Sciences Specialization**

The Certificate of Advanced Study (CAS) in Library and Information Science is a post-master's program that is designed for practitioners who seek an articulated and systematic continuing education program to enhance their professional career development. For students pursuing this certificate, emphasis in the program would be placed on health sciences information management. It is expected that students will use this program to redirect their career paths or to update their skills.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the CAS with Health Sciences Specialization.

A. Academic content: Please circle FOUR of the following areas of knowledge that you consider MOST important to the certificate program for health sciences information professionals.

1. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
18 (32.7%)

2. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
30 (54.5%)

3. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
32 (58.2%)

4. Biomedical and health sciences information resources (e.g., current and historical resources, print and electronic formats, courseware, consumer health information)
13 (23.6%)

5. Creation, management, and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
38 (69.1%)

6. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
34 (61.8%)

7. Design, delivery, and evaluation of education in information management (e.g., instructional design, cognitive psychology)
14 (25.5%)

8. General knowledge of biomedical and health sciences (e.g., basic and clinical sciences, public health, allied health)
8 (14.5%)

9. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
26 (47.3%)

10. Specialized knowledge in at least one biomedical discipline (e.g., anatomy, molecular biology, epidemiology, pharmacy)
4 (7.3%)

*Are there other areas of knowledge you consider important to the education of new master's degree candidates?*

B. Experiential content: Please circle TWO from the following experiential opportunities that you consider MOST important to the successful CAS participant.

1. Site visits to health sciences libraries or information centers
11 (20.0%)

2. Site visits to health sciences information settings (e.g., schools, hospitals, HMOs, corporate centers)
20 (36.4%)

3. Site visits to health care settings (e.g., clinical, educational, or research)
6 (10.9%)

4. A major site-related project in one of the sites mentioned above
35 (63.6%)

5. A set of smaller site-related projects in one or more of the sites mentioned above
33 (61.1%)

*Are there other types of field experiences that you consider important?*

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: Candidates for the CAS may come from a variety of academic and work backgrounds. Please circle THREE prerequisites that you consider MOST important to the successful CAS participant.

1. No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study
   19 (34.5%)

2. Previous coursework in biomedical or health sciences
   11 (20.0%)

3. Bachelor's degree in biomedical or health sciences
   4 (7.3%)

4. Master's degree in library or information science
   41 (74.5%)

5. Master's degree in biomedical or health sciences
   12 (21.8%)

6. Previous work experience in a library or information management setting
   39 (70.9%)

7. Previous work experience in a health care setting
   22 (40.0%)

*Are there other prerequisites that you consider important?*

B. Delivery method: Please circle ONE of the following methods of delivering course content that you consider MOST desirable.

1. On-campus classes
   5 (9.1%)

2. A combination of on-campus classes and off-campus, remote (e.g., through World Wide Web-accessible) classes
   47 (85.5%)

3. Teleconferenced classes
   1 (1.8%)

*Are there other content delivery methods that you consider desirable?*

C. Structure: Please circle option a or b for the choice you consider MOST desirable for each of the following issues.

1. Length of program
   a. Current length of the program (10 courses)
      45 (81.8%)

   b. Expanded length (11-15 courses)
      8 (14.5%)

2. Student status
   a. Full-time student status required
      5 (9.1%)

   b. Part-time student status possible
      50 (90.9%)

3. Program content
   a. Each student's program *individualized* to address student's interests and needs
      36 (65.5%)

   b. A *common core of* advanced courses to create a consistent body of knowledge
      18 (32.7%)

4. The award of a certificate or other credential upon completion is important?
   a. Yes
      54 (98.2%)

   b. No
      1 (1.8%)

*Are there other structural issues you consider important?*

**Program: Executive Certificate of Advanced Study (ECAS) with Health Sciences Specialization**

The Executive Certificate of Advanced Study (ECAS) is a post-master's program that will include a combination of work on campus and at the individual's own work site. It will include exposure to a variety of health care settings and to leaders in the field of health sciences information management. The ECAS will create a "virtual community" of participants who will remain at their work sites while attending classes, completing assignments, and communicating with one another electronically. They will also meet together on campus at certain intervals. A primary difference between the CAS and the ECAS is the ability to use information and communications technology to combine on-site and off-site work experiences and academic content. It will provide opportunities for experienced information professionals to enrich and strengthen existing capabilities, to develop a subject or

functional specialty, to redirect a career path, or to prepare for an executive or administrative position.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the ECAS with Health Sciences Specialization.

A. Academic content: Please circle FOUR of the following areas of knowledge that you consider MOST important to the executive certificate program for health sciences information professionals.

1. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
33 (60.0%)

2. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
41 (74.5%)

3. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
31 (56.4%)

4. Biomedical and health sciences information resources (e.g., current and historical resources, print and electronic formats, courseware, consumer health information)
6 (10.9%)

5. Creation, management, and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
31 (56.4%)

6. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
33 (60.0%)

7. Design, delivery, and evaluation of education in information management (e.g., instructional design, cognitive psychology)
5 (9.1%)

8. General knowledge of biomedical and health sciences (e.g., basic and clinical sciences, public health, allied health)
4 (7.3%)

9. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
33 (60.0%)

10. Specialized knowledge in at least one biomedical discipline (e.g., anatomy, molecular biology, epidemiology, pharmacy)
2 (3.6%)

*Are there other areas of knowledge you consider important to the successful ECAS participant?*

B. Experiential content: Please circle TWO from the following experiential opportunities that you consider MOST important to the successful ECAS participant.

1. Site visits to health sciences libraries or information centers
8 (14.5%)

2. Site visits to health sciences information settings (e.g., schools, hospitals, HMOs, corporate centers)
24 (43.6%)

3. Site visits to health care settings (e.g., clinical, educational, or research)
10 (18.2%)

4. A major site-related project in one of the sites mentioned above
32 (58.2%)

5. A set of smaller site-related projects in one or more of the sites mentioned above.
30 (54.5%)

*Are there other types of field experiences that you consider important?*

*Have you any suggestions for types of sites?*

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: Candidates for the ECAS may come from a variety of academic and work backgrounds. Please circle THREE prerequisites that you consider MOST important to the successful ECAS participant.

1. No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study
   22 (40.0%)

2. Previous coursework in biomedical or health sciences
   6 (10.9%)

3. Bachelor's degree in biomedical or health sciences
   1 (1.8%)

4. Master's degree in library or information science
   40 (72.7%)

5. Master's degree in biomedical or health sciences
   15 (27.3%)

6. Previous work experience in a library or information management setting
   37 (67.3%)

7. Previous work experience in a health care setting
   23 (41.8%)

*Are there other prerequisites that you consider important?*

B. Delivery method: The method of delivering course content is one of the features that distinguishes the ECAS from the CAS. Please circle ONE option for the choice you consider MOST desirable for each of the following issues.

1. Delivery method for academic content
   a. On-campus classes
      0

   b. A combination of on-campus courses and off-campus, remote (e.g., World Wide Web-accessible) classes
      44 (80.0%)

   c. Teleconferenced course offerings
      11 (20.0%)

2. Delivery method for experiential content
   a. Site visits to health information settings in the campus area
      8 (14.5%)

b. Electronically presented (e.g., World Wide Web-based) site visits to selected health information settings
12 (21.8%)

c. Site visits to health information settings in the participant's local area.
34 (61.8%)

*Are there other methods of delivering experiential content that you consider important?*

3. Delivery schedule for each course
   a. 1/2 day 8 times per 4-month session
   14 (25.5%)

   b. 1 day 4 times per 4-month session
   21 (38.2%)

   c. 2 weekends per 4-month session
   20 (36.4%)

   d. Other frequency (specify):
   0

C. Structure: Please circle ONE option for the choice you consider MOST desirable for each of the following issues.

1. Length of program
   a. Shorter than the CAS, i.e., 6-9 courses
   15 (27.3%)

   b. Equal to the CAS, i.e., 10 courses
   29 (52.7%)

   c. Longer than the CAS, i.e., 11-15 courses
   10 (18.2%)

2. Time for completion
   a. One year
   13 (23.6%)

   b. Two years
   33 (60.0%)

c. Three years
8 (14.5%)

3. Program content
   a. Each student's program *individualized* to address student's interests and needs
   39 (70.9%)

   b. A *common core* of advanced courses to create a consistent body of knowledge
   15 (27.3%)

4. The award of a certificate or other credential upon completion is important?
   a. Yes
   52 (94.5%)

   b. No
   1 (1.8%)

5. Advisor or mentor
   a. On-campus faculty member
   26 (47.3%)

   b. Off-campus, site-based mentor
   28 (50.9%)

6. Special project(s)
   a. Collaborative projects drawing on the students' varied backgrounds and experience
   29 (52.7%)

   b. Individual projects based on the individual student's interests and needs
   26 (47.3%)

*Are there other structural issues you consider important?*

**Program: Ph.D. with Health Sciences Specialization**

The purpose of the doctoral program in the School of Information and Library Science is to educate scholars who are capable of addressing problems of scholarly consequence in the fields of information and library science. Graduates of the program are prepared to conduct productive, independent, and scholarly research in universities, government agencies, and other institutions in which issues of information communication and retrieval are addressed.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the Ph.D. with Health Sciences Specialization.

A. Academic content: The Ph.D. requires at a minimum one basic seminar in information retrieval, another on scholarly communication, two statistics courses, and a dissertation. From the following areas of knowledge, please circle FOUR that you consider MOST important to add to the core of requirements for the successful doctoral candidate.

1. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
20 (37.0%)

2. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
8 (14.8%)

3. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
17 (31.5%)

4. Biomedical and health sciences information resources (e.g., current and historical resources, print and electronic formats, courseware, consumer health information)
3 (5.6%)

5. Creation, management, and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
27 (50.0%)

6. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
28 (51.9%)

7. Design, delivery, and evaluation of education in information management (e.g., instructional design, cognitive psychology)
23 (42.6%)

8. General knowledge of biomedical and health sciences (e.g., basic and clinical sciences, public health, allied health)
3 (5.6%)

9 Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
19 (35.2%)

10. Research skills (e.g., research methods, statistical analysis, qualitative analysis)
42 (77.8%)

11. The role of professional education and of graduate education in the current academic environment (e.g., teaching, research, and service responsibilities)
19 (35.2%)

12. Specialized knowledge in at least one biomedical discipline (e.g., anatomy, molecular biology, epidemiology, pharmacy)
4 (7.4%)

*Are there other areas of knowledge you consider important to the successful doctoral candidate?*

B. Experiential content: Please circle ONE from the following experiential opportunities that you consider MOST important to the education of the doctoral student in health sciences information management.

1. Research practicum
29 (53.7%)

2. Experience with college or university teaching
7 (13.0%)

3. Field experience in a health sciences library or information center, or in another health information setting (e.g., health care delivery site, biomedical research or education setting, or corporate environment)
16 (29.6%)

*Are there other types of field experiences that you consider important?*

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: Please circle from the following list THREE prerequisites you consider MOST important for an incoming doctoral student.

1 No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study
18 (33.3%)

2. Previous coursework or bachelor's degree in biomedical or health sciences
   9 (16.7%)

3. Master's degree in library or information science
   43 (79.6%)

4. Master's degree in biomedical or health sciences
   20 (37.0%)

5. Previous work experience in a library or information management setting
   34 (63.0%)

6. Previous work experience in a health care setting
   20 (37.0%)

*Are there other prerequisites that you consider important?*

B. Delivery method: Please circle ONE of the following methods of delivering course content that you consider MOST desirable.

1. On-campus classes
   15 (27.8%)

2. A combination of on-campus and off-campus, remote (e.g., through World Wide Web-accessible) classes
   36 (66.7%)

3. Teleconferenced classes
   2 (3.7%)

*Are there other content delivery methods that you consider desirable?*

COMMENTS
on any aspects of the proposed programs

Is there anything else you would like to tell us about the preparation of health sciences librarians? If so, please use this space for that purpose. Also, any comments you wish to make that you think my help us as we investigate the education of health sciences librarians will be appreciated, either here or in a separate letter.

## Qualitative Data from Delphi One

### MS Academic

E6: Research design and procedures.

E9: MLS or other information-related graduate degree is a necessary base from which to work.

E13: Research methodologies.

E15: #6 [Design and evaluation of information services and programs] should be part of core curriculum.

E19: I believe a course on behavioral interactions is important.

E23: User needs and behavior. Managing the service environment.

MC1: Intro to research design and analysis. Development of business cases.

MC20: Area #4 [Biomedical and health sciences information resources] could be combined with #8 [General knowledge of biomedical and health sciences] and #9 [Health care environment] in experiential learning. Using the tools of the discipline to lean about the discipline being considered.

MC20: Students should also learn how to do qualitative analysis of the literature – understanding statistics used, etc.

MC23: I believe it is essential to instill a strong attitude of service, stewardship and high ethical standards in master's candidates. Coursework directed towards these goals is of great value to the individual and the profession.

MC24: Are we assuming new students have basic computer literacy skills and basic statistics?

EAG6: 8 [General knowledge of biomedical and health sciences] – but not as core; require if the candidate does not have previous education/experience in biomedical/health sciences.

### MS Experiential

E15: Since the program should be tailored to individual needs and interests, the content could be either 1 or 2 [Operations or Systems]. I do not think #3 [Introduction to a health environment] is as valuable as 1 or 2.

E19: Item 2 [Practical knowledge of systems] is a very close second [after item 3, Introduction to a health environment].

E23: Systems development.

MC1: This really depends on the interests and skills of the student. I would hope they receive explosure to operations and systems support to assess which setting they prefer.

MC10: I think this would depend on future career plans an should be part of academic planning initially.

MC23: In my opinion, options one and two would be equally desirable, depending upon the individual's interests.

MC24: Any kind of technical support and teaching experiences would be valuable.

**MS Prerequisites**

E4: Bachelor's degree in computer science or coursework in computer science.

E7: Communication skills; computer science coursework.

E10: I don't consider any of the four to be nearly as important as the demonstrated ability to write clearly and to present well in public. I'd like to see an interview required to weed out geeks and weirdos.

E15: Computer science.

E18: Information systems experience.

E19: Some behavioral courses – psychology or sociology.

E22: Prerequisites are intangibles – intellectual curiosity, desire to learn, skills in organizing and working with people.

E23: Interest in the health care environment.

MC10: Healthcare setting (#3) could be hospital, academic (med center), corporation/industry (health-related), or even being a health care professional.

MC13: I wouldn't mind an "or" between all of the above, but do not, in general, favor prerequisites at this level.

MC17: Note: I marked number 1, but I don't think previous coursework in the sciences needs to be an absolute requirement. You would lose too many good people who hadn't taken any science courses.

MC18: #3 should be considered in a very broad sense [previous work experience in a health care setting].

MC19: If #2 [BS in basic or health-related sciences] then #8 in question A [General knowledge of biomedical and health sciences] wouldn't be one of my choices.

MC21: Previous coursework in health-related sciences.

MC24: I don't like any of these unless #1, basic sciences, includes math. I think these are way too restrictive. I'm not sure I had any of them, including math!

EAG6: I am not necessarily in favor of making any of the above prerequisites. I would prefer that 1, 2 or 3 be preferred and that students be allowed to take additional coursework if they don't have any of them.

**MS Delivery**

E4: Internships.

E15: I am assuming that teleconferencing can be another delivery method for #2 (Combination of on-campus and off-campus). I think it can be highly effective. Also consider videotaped presentations.

E23: Targeted internships.

MC1: Group problem solving.

MC7: Hands-on very important for learning reference tools. Need access to large library if at all possible.

MC9: I think field experiences and development projects are extremely important. Each course should emphasize application of concepts learnt.

MC10: Teleconferencing might be alright for a given number of credit hours.

MC18: Field trips.

MC24: Videotape, delivered by mail.

**MS Structure**

E4: Internship required.

E7: Length of program may of course be longer if part-time students are also included. In no case should students go beyond 36 months without getting a degree.

E10: A practicum in a library. A small seminar (6 students, max) to discuss future trends and consider technological developments.

E15: Length [of program] is derived from content; I have no preference.

E15: Internship program or at least a practicum with a course.

E18: Practicum – needs assessment and development of tools to help specific types of users access relevant information.

E22: A field experience or internship should be required.

E23: Internship.

MC9: Internships with course credit.

MC12: Provide a mechanism for part-time students to have the same access to one another and to faculty that full-time students have.

MC17: The field experience for anyone who has not worked in a library.

MC18: Practicum/internship in a health sciences library.

MC22: Field study.

MC24: Field experience, 2 different ones are possible. Independent study is possible.

**AIP Experiential**

E2: A project related to #5 [Observations of health care environments in general].

E4: A research-orient [internship] in an academic medical informatics program. [Host sites:] health sciences libraries that are centers of excellence, e.g. IAIMS or knowledge engineering program collaborators. [Special projects:] knowledge base design or evaluation; IAIMS-type systems design; organizational development study.

E6: [Host sites:] medical schools, teaching hospitals, research centers. [Special projects:] designing of library systems to maintain essential services with a 20 percent reduction in financial and human resources.

E10: Following the library director around for a few weeks. [Host sites:] academic medical center libraries with active IAIMS grants. [Special projects:] observational/interview studies of how information is accessed or used.

E13: [Host sites:] medical center and hospital libraries that have embraced IAIMS concepts in their operations.

E14: Attendance at 2 or more relevant professional meetings. Assistance on a team working on a poster presentation or paper for a professional meeting. [Special projects:] Home page design and construction; experience with presentation software.

E15: Intern could work under the direction of medical informatics faculty at UNC-CH or Duke. [Host sites:] None, other than the above. I do not support observation assignments; one learns by doing, not observing. Also, I don't think a project should substitute for supervised work experience. [Special projects:] Collaboration with hospital systems staff and/or medical faculty on interface design for a clinical information system or Web-based information services. Projects should derive from work assignments.

E19: I prefer action vs. observation.

E21: Internships should be hands-on and include some specific area of responsibility. [Host site:] MD group practice.

E23: [Host sites:] Institutions with medical informatics programs. [Special projects:] some aspect of system planning, system development, or system support (esp. instruction).

E25: [Host sites:] Insurance companies (HMO's – managed care companies).

MC1: Combine experience with classroom teaching. [Host sites:] Health sciences libraries in a hospital or academic setting. Information systems dept. in a hospital/academic setting. [Special projects:] How to encourage research in a hospital library. Create pathfinders on specific topics. Create an Internet training strategy. Electronic collection management. Create a library Intranet.

MC2: [Special projects:] Development of a plan for connecting hospital units to Internet resources/library databases. Choose best system for connection, best resources for clinicians and patients and educational roll-out [?]. Evaluate effectiveness.

MC4: Projects are more productive than educational visits. [Host sites:] Community hospitals, large teaching hospitals and IAIMS sites. [Special projects:] Depends on the interests/abilities of the participants. Perhaps potential interns should develop proposals.

MC7: Hands-on more important than observation. [Host sites:] Large academic libraries, large hospitals, drug/biotechnology firms, government facilities (i.e. VA, NASA). [Special projects:] system conversion, IAIMS plans, networking, multimedia training "classes"/programs. Needs assessment, surveys, outreach programs.

MC9: It would be valuable to work in a team with a health professional e.g. at a clinic to find info for a real case, or working with faculty in curriculum development. [Host sites:] hospitals, clinics, university, health sciences library. [Special projects:] Development of a database, implementing a system, finding information needs of the environment health sciences librarians may operate in.

MC10: Should have some focus on fiscal responsibility (budgeting, evaluating cost-effectiveness, etc.). [Host sites:] I think a variety could be used but suggest tailoring to future career plans where possible; could be health care or industry setting. [Special projects:] Development of institution wide systems strategic plan; implementation of a new information network or technology within an organization; development of a database, system, training program, etc.

MC14: [Special projects:] Would depend on setting and the practical research questions arising from it.

MC16: Working directly with librarians who have achieved recognition by retooling to the new skill sets required. [Host sites:] IAIMS sites or other libraries/information agencies with advanced information systems. [Special projects:] Developing plans to link disparate information systems, to include working with various institutional sectors to accomplish integration.

MC17: [Special projects:] Developing/managing a WWW site. Assisting a library director in budget development.

MC18: Hospitals, HMO's academic libraries with strong health sciences, veterinary, pharmacy, allied health, public health, etc.

MC19: Supervised work experience in a health care environment.

MC20: As a reference information specialist with a networked research group, e.g. Cochrane Study. Bringing together – i.e. acting as a mediator amongst groups to develop excellent consensus [?] health info resources.

MC23: Encouraging attendance at relevant professional meetings introduces students to professionals working in varied work settings. [Special projects:] A needs study in an assigned area would be useful both to the intern and the mentor/host.

MC24: [Host sites:] Planned Parenthood clinics. Any type of clinic focused on wellness. Your basic doc-in-a-box clinic. [Special projects:] Working with an organization with a public health or advocacy goal. Lots of information dissemination work here.

EAG 4: [Host sites:] They must be excellent.

EAG6: #5, Also visits to a range of health information service organizations, e.g. NLM, hospital, academic centers, corporate libraries, etc. [Host sites:] All of the above. Biggest issue may be on site mentor/leader. [Special projects:] Should be based on needs/interest of interns and host institutions.

EAG8: [Host sites:] Health care systems and health plans. [Special projects:] Participate in development of decision support systems that integrate patient information, knowledge-based information, and aggregate data.

EAG9: [Host sites:] Columbia HCA; Large medical complexes; CDC. [Special projects:] Assess and design data library for a state health dept.

**AIP Academic**

E1: Current health systems and health policy; management and leadership training; communications skill building. All are essential to succeed in a contemporary health sciences library.

E2: See section I.A.#3-6 [(3) systems design, (4) information resources, (5) creation, mgmt and use of systems, and (6) design and evaluation of services and programs]. These serve as the building blocks of any project in today's environment.

E4: (1) Computer science if not previously had; (2) program evaluation methods. (1) to support librarianship skills and provide foundation for collaboration with systems or content experts. (2) to allow for systematic evaluation of products and services.

E5: Biomedical/health information resources and environment. For professionals wishing to switch to health sciences librarianship who did not take such courses in the master's program.

E6: Systems design; seminar on philosophy or on current issues and problems. Enhancement of technical skill. Develop understanding of the context, purpose and connectivity of health sciences information to health care systems and community/societal needs.

E7: Management skills and content development, e.g. organizational behavior, managerial accounting and budgeting, group dynamics, computer sciences e.g. health informatics, values and biomedical ethics. These skills and insights will be more critical to career success.

E10: Research methods, esp. survey technique. Because so much of library research is done through survey[s], and so many of them are done so badly.

E12: [Formal coursework]: None is essential other than basic grounding health care, information technology and library science concepts, jargon and operations. Internships are generally short and students have modest experience. Hence they usually are assigned to projects where their role is to be bright, energetic arms and legs.

E13: (1) Advanced management skills; (2) Design and evaluation of information services and programs; (3) Design, delivery and evaluation of education in information management. I believe a combination of advanced level courses and work experience are necessary to derive the greatest benefit form the internship experience.

E14: [Formal coursework:] None need be required, but participants should have the option of formal coursework.

E15: Medical informatics – similar to topics covered by NLM's course at Woods Hole. Cognitive science topics such as human factors in interface design. Similar to executive management institutes, program should offer series of speakers from health care setting (e.g. medical enter CEO and CIO, medical school dean, HMO administrator) to give perspectives on health care environment. These could be videotaped for distribution. These are areas lacking in traditional training and work environments.

E19: Courses (or lectures) that cover the current events, etc. Some examples include: discussion of the literature in current topics, hot topic discussions with experts. Need to be as current as possible and also to set a life-long template for dealing with change.

E21: I am concerned about the lack of formal knowledge in database development, indexing skills and theory. These seem logical extension of the library profession but few graduates have been exposed.

E22: Basic health sciences librarianship course which includes introduction to profession and reference sources. Database design, identification and search. So internship can focus on experience, not in providing "basic" education.

E23: More organization of knowledge and user needs, because they are the core of our profession. Evaluation/feedback, because an internship is a good opportunity to apply and learn evaluation skills.

E25: At a minimum, a basic course in business reference tools. The business model has been adapted by all progressive health care delivery organizations.

MC1: Intro to reference sources in health sciences. Advanced systems design. Advanced MEDLARS searching. Appreciation and understanding of health care trends. Understanding of resource sharing structure (e.g. networks) of health sciences libraries.

MC4: Ideally, the internship would follow the core of required course, and elective of interest to the individual students. Recent graduates would also be interested in such a training opportunity, as well as generalist librarians wishing to specialize in the health sciences.

MC7: The structure of information. In an era of easy information retrieval – point and click – it is important to understand how information is structured (remember the card catalog?) and hierarchical retrieval methods.

MC9: This would be an excellent opportunity to get course from computer science, business admin, education or biomedical engineering/medical informatics. Depending on the librarians' interest and need for specialization, exposure to a non-SILS perspective may be useful.

MC10: Beyond the master's degree – proficiency and experience in using a variety of computer/information systems (and validated by coursework, if strictly experiential). Also, something addressing fiscal planning.

MC13: I would look at the core curriculum of the master's program and at the individual's background to see if there were any "deficiencies" that this program could address for this individual. Otherwise, I see internships as an opportunity for structured application of learning in a "live" setting.

MC14: [Formal coursework:] Minimal – only those areas where there is a deficiency – e.g. health care environment, information systems design. To emphasize practical experiences and de-emphasize class work, but also to allow interns to fill in perceived gaps in their backgrounds/training.

MC16: Systems design as it relates to the customer (the ultimate user of the system). This would help engrain the concept that success depends on how well the system is accepted by and affects the decision-making of the user.

MC17: There should be a formal seminar associated with this internship. The seminar would enable the student to put his/her internship experience in perspective as compared to other students' experience. Also, it would require the student to look at his/her experience in an objective manner to judge its worth.

MC18: Biomedical and health sciences information resources, including electronic/WWW based in particular. This field changes so rapidly. Program needs to have all participants start with a level playing field – this course would do that.

MC19: Network design; telecommunications.

MC20: Benchmarking and outcomes measurement. Research methods. While some of us may have taken these few enough are doing. During an internship we should probably be looking at the effectiveness of the projects we are involved in.

MC21: Biomedical and health sciences information resources. Health information systems. Need background to start building on.

MC22: Medical informatics; strategic planning; project management; health care environment. The medical informatics and health care courses would provide knowledge base. Strategic planning and project management would enable the individual to act individually in a project-oriented manner, which might be of most use to the host site.

MC23: While formal coursework might not be appropriate or essential in an internship, it should result in a product, such as a final report or presentation. This permits the intern to summarize the experiences, and provides a better understanding of the process.

MC24: See #2 and #6 [Supervised work and a special project]. These will mean more this time around because of the candidate's experience. They need these skills and they'll really be ready to absorb them now.

MD25: Must get some theory, some academic grounding. Because experience without framework is just plain work.

EAG2: Rather than formal coursework I suggest a series of seminars, and/or self-directed study models aimed at key core areas. These should focus on both "current awareness" of trends such as new and evolving methods of information [?], copyright, and legal implications of these, trends an changes in the field of healthcare informatics (i.e. outcomes research) and sociological implications of greater access, by both patients and health care professionals, to healthcare information. Also address strategic issues likely to affect healthcare delivery in the future.

EAG3: (1) Overview of health sciences reference tools – both print and electronic. (2) Overview of trends and economic climate of the health field today. (1) Because librarians coming from nonmedical library settings would lack this. (2) Because it is difficult to operate in a health sciences library without it.

EAG4: If not previously studied: (1) research methods applicable to user studies, outcomes, etc.; (2) health care / public health environment; (3) principles of organization of information, e.g. indexing, thesaurus and health classification construction; (4) overview of medical informatics. Desirable, not essential. I would require only one course from among those above.

EAG8: No formal coursework except readings in the area of internship. The master's preparation should address the coursework baseline. The focus is on hands-on experience and self-learning in the internship – and how to use resources available in the work world to problem-solve.

EAG9: Health administration courses including management, health policy, health information system. Need to learn how and where data is collected, how it is used, to determine better ways to manage it and integrate with scholarly literature.

**AIP Prerequisites**

E2: Excellent communication skills.

E10: Written statement of purpose.

MC9: Master's degree in any area related to information sciences.

MC14: [Noted that either #2 (MLS in LIS) or #3 (MS in biomedical/health sciences) would be one selection.]

MC24: Candidate statement of their goals.

**AIP Structure**

E4: Formal investigation into the department or division of the institution when the internship is completed.

E7: I strongly believe that both an on-campus and an off-campus site-based mentor is crucial to optimal outcomes.

E13: Some end product – thesis, research paper, report, publication – is desirable to demonstrate success/achievement.

E19: Keep the mentor as close to the student intern as possible.

E21: Would urge a combination advisor/mentor – site-based working with faculty member.

E22: Two months if full-time, six months if part-time.

E22: Both [on-campus and off-campus advisor/mentor] are important.

E22: Meeting on a regular basis with a peer group of interns or "beginning" librarians.

E23: Opportunity to interact with other interns.

MC6: Combination of observation of various positions and activities of the library and special projects.

MC10: [Noted that both an on-campus and off-campus advisor/mentor is desirable.]

MC10: Actually, I could go for a 6 month program – preferable. 12 months may be too long for internship – more appropriate for the CAS.

MC12: Regular contact by faculty advisor with both student and site-based mentor to ensure that student is receiving appropriate insturction and feedback and is participating in activities as specified by the Advanced Internship Program (i.e., if assigned to a supervised work experience, is the student being given the opportunity to participate in work rather than merely observing?).

MC17: Note: No. 2 asks about advisor/mentor. You would need both a faculty advisor (or at least a faculty member who would teach the seminar class) and a site-based mentor who would be responsible for making sure the intern is being utilized and integrated into the workplace.

MC20: The on-campus faculty member should make regular contact with a site-based "mentor" /supervisor. Partnership aspect.

MC22: Note: for #1, a semester length 3-4 [months] would also be acceptable.

**CAS Academic**

E4: Computer science.

E15: Leadership project / management skills. Group process skills, public speaking skills – those with no health sciences background will need #4 [biomedical and health information resources], too.

E23: Collaborative skills.

MC10: The program should validate prior work in health care, library, biomedical field. Also candidates should have demonstrated basic presentation skills before entering the program.

EAG8: I assume this is for people with "old" or non-library master's degrees – which is why I've circled the same items as for the master's in library science.

**CAS Experiential**

E14: Attendance and possible presentations (poster; paper) at 2 or more professional meetings.

MC17: Note: I think the student should have a choice between no. 4 [A major site-related project] and no. 5 [A set of smaller site-related projects].

MC19: Shadowing or work experience in a health site (research or clinical).

MC23: I believe goal-oriented field experiences (i.e. projects) to be highly rewarding.

EAG6: A major project at home site – seems for feasible for mid-career people.

EAG9: Site visits, in general, seem too superficial, I need a definition of what a site visit would entail.

**CAS Prerequisites**

E1: If it's post-master's it pretty much eliminates 1 and 3 as options.

E4: If it is post-master's by definition then a MS is prerequisite. MS in medical informatics.

E10: An advanced degree of some kind, but I wouldn't differentiate. I know someone with a master's in journalism who would like to do this.

E14: Demonstration of enthusiasm and relevance of CAS program to career.

E15: I am assuming #6 [Previous work experience in a library or information management setting] includes a broad range of settings such as systems-related positions.

E22: Desire to learn – good oral and written communication skills.

MC9: Master's degree in fields related to information science such as education, computer science, etc. I think the work experience is more important.

MC23: The candidate should possess a rudimentary knowledge of the area that will be studied during this program.

EAG6: Assume the individual has to have a master's degree. It's really 1,4,5,6 or 7.

EAG8: [Notes that the selections would be for either 4 or 5 and either 6 or 7.]

**CAS Delivery**

E15: Also include teleconferencing.

MC10: A combination of the three could work. Some combination of on and off-campus courses seems most feasible.

MC20: A combination of all three. Students need to share ideas with on-campus colleagues both in front of class but it is also helpful to do as muich of this work as possible for distance learning.

MC24: Videotape via mail.

**CAS Structure**

MC6: Note re 3 above [Program content – individualized vs. common core program]: A core of 3-4 courses, the rest individualized.

MC6: Assignment to "mentor" from the field, selected from a group of "adjunct" instructors, would be desirable.

MC10: A common core seems important with some optional aspects (individual tailoring).

MC24: Consider 2 advisors or some formal career counseling component.

EAG9: On and off campus advisor.

**ECAS Academic**

MC10: Number 2 and 10 [Advanced management skills; Specialized knowledge in a biomedical discipline] might be interchangeable depending on individual circumstance.

MC17: I assume they would already have the knowledge described in no. 4 [ Biomedical and health sciences information resources].

EAG8: It seems to me that 8 and 10 are needed, but not the focus of the ECAS. They should be gotten elsewhere.

**ECAS Experiential**

E14: Professional meeting attendance; paper/poster presentation.

E15: No [other types of field experiences], but care should be given to ascertaining the perspectives of health care providers and administrators at these sites. [Host sites:] select the best representative sites in the U.S. and videotape them. You could then provide a mix of visits to locally –available sites along with remote sites on videotape.

E22: Evidence of working in an environment or on a project that involves management of people and/or resources.

MC7: I'm assuming the work sites is library/information related in some way. [Sites:] See page 4 -- same ["Large academic libraries, large hospitals, drug/biotechnology firm, government facilities (i.e. VA, NASA)."]

MC24: Any site with a focus on consumer health.

EAG6: A major special project at home site (it seems more feasible for mid-career types).

EAG8: [Host sites:] Health care systems and health plans.

EAG9: NLM, CDC, HMO's, IAIMS institutions.

**ECAS Prerequisites**

E4: MS in medical informatics.

E6: Answer #1 may be interpreted as excluding all other answers. Coursework in health sciences and work experience in a health care setting would be useful but not required.

E15: Since this is a post-master's program, a master's degree is a prerequisite.

E15: No [other requirements]. Requirements should be minimal to attract the best candidates from a variety of backgrounds.

E19: [Had selected items 2, 4 and 5. Notes that one of the selections was for either item 4 or 5 (master's in LIS or in a biomedical science).]

E22: [Notes that one selection is for either 4 or 5 as a prerequisite (master's in LIS or biomedicine).]

MC24: Certain number of years of experience, maybe 5-7?

EAG8: [Notes that the selection is for 4 or 5 and 6 or 7.]

**ECAS Delivery**

E15: Videocassettes – there should be a mix of media for delivery of remote instruction with the choice of medium determined by content.

E15: [Site visits to health information settings in the participant's local area (#2.c.) are] desirable, but it's difficult to ensure quality and content at variable locations.

E18: Why? [A reference to the paragraph introducing the ECAS: "A primary difference between the CAS and the ECAS is the ability to use information and communications technology to combine on-site and off-site work experiences and academic content."]

MC17: Note: 'b' – virtual site visits don't count in my book! They can be important learning tools, but they are not site visits.

MC20: A combination of all of the above would be best.

MC24: Video.

EAG1: b and c so that 2 courses could be taken reasonably in each 4 month period.

EAG8: Distance learning and networking; Computer-based training: WWW accessible.

EAG9: Site visits to non-campus (UNC) or to areas familiar to the participant.

**ECAS Structure**

E7: See page 6 [I strongly believe that both an on-campus and an off-campus site-based mentor is crucial to optimal outcomes]. #6: Both options [Collaborative and individual projects] should be pursued.

E15: [3.b.: A common core of advanced courses to create a consistent body of knowledge] – core could be small to allow for individualization for students' needs.

MC10: [Notes that a combination of on and off-campus advisor/mentor is desirable.]

MC23: Since this program is designed for information specialists who are currently employed, a high degree of flexibility in design and scheduling should be maintained.

EAG6: Really need 5 a and b [on and off-campus advisor/mentor].

**PhD Academic**

E4: Medical informatics basics.

E23: Organizational knowledge.

MC9: Medical informatics.

MC10: Practical working knowledge and past experience in health care settings and information management.

MC17: Note: Wouldn't the research skills in no. 10 be covered under the required courses on statistics and scholarly communication? If not, then it should be included in my group of 4 in place of no. 8 [general knowledge of biomedical and health sciences].

MC23: Aside from the four items I circled, I consider choices 3, 7 and 12 to be highly useful to doctoral candidates.

EAG6: 7, 3, 1.

**PhD Experiential**

E15: Teaching experience will be important for those who want to teach in college or univesity settings. Field experience with medical informatics faculty could be very beneficial.

E16: Experiential content should be appropriate to participant's future professional plans.

MC4: Collaborative projects are also important.

MC12: Practical experience in all 3 areas above is desirable.

MC20: By 1, I assume that this would be a practicum/field experience with a research component – i.e. value of one course.

EAG4: PhD must be intensive and relevant.

**PhD Prerequisites**

E4: I assume a BA or MA is required so an MS in medical informatics is another option.

E22: [Notes that one selection is for either #3 or #4 (master's in LIS or a biomedical sciences).]

EAG8: [Notes that selection is for 3 or 4 and 5 or 6, as well as 1.]

**PhD Delivery**

E4: Independent study.

MC9: Research at work-site.

MC20: Combination of all three.

**Closing Comments:**

E4: In general some combination of the content, skills and tools from the field of medical informatics combined with the content, skills and tools of librarianship should produce the graduates needed. Any combination of a two-year program; a one-year program with a poster-master's program either internship, certificate or advanced certificate program could work. The PhD should train research/teaching candidates. It might be helpful to look at an undergraduate BA degree in information science that combines some aspects of computer science with some basics of librarianship, e.g. information retrieval, cataloging and classification, information science. Then the MLS could provide specialization.

E7: I'd advise the program to have a national advisory group of 7-10 individuals to meet annually to discuss program with faculty and students. Advisors should be drawn from a wide spectrum of the "user" community, broadly defined.

E9: As my responses indicate, I see little difference in the content or preparation for these various options – all afford a common base of competencies which foster continual growth.

E15: I am concerned about the differentiation of the CAS and the ECAS based primarily on the mode of delivery of the course content and the use of information technology and telecommunications to combine on-site and offsite work experience and academic content. Since the participants in either of these programs are working professionals, why not offer this opportunity to both programs? The distinction between the programs should be based on the objectives of the programs and their course content. The objectives for the ECAS should be more narrowly defined to provide opportunities to develop a subject or functional specialty or to prepare for a leadership position.

E19: Excellent survey instrument!

E21: The breadth of health sciences librarianship is so inclusive that the term itself may be confusing. Many hospital librarians must deal as intensely with corporate issues as health

care issues. Clarity here would be useful. For my library with the school's heavy research agenda bioinformatics is growing. Therefore we have huge need for individuals with knowledge of biomedicine, chemistry, etc. I think it is imperative that health sciences librarians have major intest in the content of their field – e.g. must be fascinated by, or interested in shaping health care delivery, science, etc. Otherwise health sciences librarianship becomes generic librarianship.

E22: I believe that some of the distinctions between programs are unclear, especially between advanced internship and advanced study – I think an internship should be part of the basic master's program. If the advanced internship is for people making career changes into health sciences librarianship, that might be useful, but for MLS students the content and experience should be part of the basic degree.

MC1: It was difficult to assess the value of new courses or their proposed frequency without knowing the content/length for all the programs.

MC4: Preparing tomorrow's health sciences librarians requires a variety of instructional formats, effective instructors and creative/innovative use of emerging technologies. Please emphasize using technology to teach technology, and give library students and librarians frequent opportunities to create and present useful resources.

MC4: Any program that prepares health sciences librarians should consider attracting generalist librarians or "disenchanted" allied health professionals to the field. Also, hospital librarians may wish to "retool" in order to compete for academic health sciences library positions. Although I am biased against part-time graduate study per se, I welcome internship and certificate programs for librarians.

MC10: Sorry, folks, they began to run together! Common threads for post-master's programs:

- Pre-req: MLS and some working experience in libraries or healthcare.
- Courses on campus always preferable to teleconferencing, WWW, etc. but combination probably necessary for mid-career candidates.
- I feel a common core is imporatnt for master's ECAS especially.
- Programs (all of them except PhD, MLS) have to be tailored in some way to individual experience and career expectations.
- Advisors should be on-campus, academic. Mentors can be site-based. But the combination is needed.
- How much do these programs cost? Will graduates be able to recoup via increased earning potential?

MC12: If courses on indexing are included, include a professional indexer in the faculty for this course.

MC13: The ECAS is especially attractive in that it uses the information and communications technologies to deliver the program. This is something all home institutions are doing, or need to be doing. To use these technologies in gaining advanced education would be a wonderful way to model this technology.

MC17: I think trying to implement all of these at one school would make the administrative and faculty effort too diffuse. I think you should concentrate on two: the Master's with Health Sciences Specialization, and the ECAS with Health Sciences Specialization. I guess a school already offering a PhD could institute a Health Sciences Specialization without an extraordinary effort. I think you should not emphasize the health care trends as an area of knowledge to be taught. Although it's extremely important right now (and will continue to be, considering the aging "baby-boomers"), I think it's too faddish. Just remember that health sciences librarians don't all work in hospital libraries or med school libraries. Many of them work in basic research institutions and need to know more about information resources having to do with experiments (techniques, and the use of animals) and molecular biology.

MC19: Some effort must be made to incorporate the stimulation of new ideas and new ways of looking at the educational enterprise; corporate models, chaos theory, continuous quality improvement don't appear here.

EAG4: Never never offer watered down courses. Model your executive programs on those of the best executive MBA's. Ally with the private sector (e.g. telecommunications companies). Strong emphasis on technology and management. PhDs should be competitive for CIO and CEO positions.

EAG6: Am not sure that all three "certificate" programs are needed (i.e. AIP, CAS, ECAS) or that they are sufficiently distinguishable.

To: Delphi Study Participants

From: Barbara Moran, Ph.D.
Principal Investigator
"Preparing Tomorrow's Health Sciences Librarians"

Date: August 21, 1996

Subject: Round Two

Thank you for your participation in round one of the Delphi Study on the preparation of tomorrow's health sciences librarians. Based on your responses and comments, we have prepared the second, final round of the Delphi study.

In the second round of the Delphi study our goal is to bring to even closer consensus the expert opinion on issues related to educational programs for health sciences librarians. The results will be the basis of our conclusions about the content, structure and delivery of the five potential programs for preparing health sciences librarians.

In addition to the survey, enclosed is an attachment summarizing the changes made to the Delphi instrument based on responses in the first round. These changes include the omission of questions for which consensus was clear. Items in the first round that were selected with low frequency have also been omitted. Finally, new items have been added to the instrument as a result of comments made in response to open-ended questions in the first round of the study. While many of the suggestions made in the first round of the study have been included as part of the second instrument, there are many more that have been recorded for consideration and inclusion in the study's final report.

Your thoughtful response to round one of the Delphi Study is greatly appreciated, as is your consideration and return of round two by *September 4*.

**Summary of Changes in Delphi Instrument:**

**Questions removed due to clear consensus**

**MSLIS: Experiential Content**

- Practical knowledge of health sciences library or information center operations gained through field experience [28 responses]
- Practical knowledge of health sciences information systems support gained through field experience [13 responses]
- Introduction to a health environment gained through field experience [8 responses]

**MSLIS: Delivery Method**

- On-campus classes [13 responses]
- A combination of on-campus classes and off-campus, remote classes [36 responses]
- Teleconferenced classes [2 responses]

**MSLIS: Structure**

Student status

- Full-time student status required [5 responses]
- Part-time student status possible [46 responses]

**Advanced Internship Program: Experiential Content**

- Supervised work experience in a health sciences library or information center [45 responses]
- Supervised work experience in health information systems operations [45 responses]
- A special project [32 responses]

*Consensus:* Supervised work experience is preferred over observation of operations or environments

**Advanced Internship Program: Structure**

Advisor or mentor

- On-campus faculty member [9 responses]
- Off-campus, site-based mentor [43 responses]

*Consensus:* Responses to open-ended questions indicate that a partnership between an on-campus faculty advisor and a site-based mentor is needed.

Award a certificate or credential upon completion

- Yes [46 responses]
- No [4 responses]

**Certificate of Advanced Study: Delivery Method**

- On-campus classes [4 responses]
- A combination of on-campus classes and off-campus, remote classes [45 responses]
- Teleconferenced classes [1 response]

**Certificate of Advanced Study: Structure**

Length of program
- Current length of program [42 responses]
- Expanded length of program [8 responses]

Student status
- Full-time student status required [4 responses]
- Part-time student status possible [47 responses]

Award a certificate or credential upon completion
- Yes [51 responses]
- No [0 responses]

**Executive Certificate of Advanced Study: Delivery Method for Academic Content**

- On-campus classes [0 responses]
- A combination of on-campus classes and off-campus, remote classes [40 responses]
- Teleconferenced classes [11 responses]

**Executive Certificate of Advanced Study: Delivery Method for Experiential Content**

- Site visits to health information settings in the campus area [8 responses]
- Electronically presented site visits to selected health information settings [12 responses]
- Site visits to health information settings in the participant's local area [31 responses]

**Executive Certificate of Advanced Study: Structure**

Award a certificate or credential upon completion
- Yes [50 responses]
- No [0 responses]

Advisor or mentor
- On-campus faculty member [25 responses]
- Off-campus, site-bases mentor [25 responses]

*Consensus:* Responses to open-ended questions indicate that a partnership between an on-campus faculty advisor and a site-bases mentor is needed.

**Ph.D. with Health Sciences Specialization: Delivery Method**

- On-campus classes [15 responses]
- A combination of on-campus classes and off-campus, remote classes [32 responses]
- Teleconferenced classes [2 responses]

**Items removed due to low frequency of selection**

**MSLIS: Academic Content**

- Advanced communications and presentation skills [15 responses]
- Advanced management skills [12 responses]
- Advanced systems design and networking [16 responses]
- Design, delivery, and evaluation of education in information management [17 responses]
- General knowledge of biomedical and health sciences [20 responses]

**MSLIS: Prerequisites**

- Bachelor's degree in basic or health-related sciences [11 responses]

**Advanced Internship Program: Prerequisites**

- Master's degree in biomedical or health sciences [8 responses]
- At least one year of professional experience in any health care setting [17 responses]
- At least one year pre-professional experience in a library or information setting [13 responses]

**Advanced Internship Program: Structure**

Length of program

- 2 months [4 responses]
- 9 months [7 responses]

**Certificate of Advanced Study: Academic Content**

- Biomedical and health sciences information resources [11 responses]
- Design, delivery, and evaluation of education in information management [13 responses]
- General knowledge of biomedical and health sciences [7 responses]
- Specialized knowledge in at least one biomedical discipline [4 responses]

**Certificate of Advanced Study: Experiential Content**

- Site visits to health sciences libraries or information centers [10 responses]
- Site visits to health care settings [5 responses]

**Certificate of Advanced Study: Prerequisites**

- Previous coursework in biomedical or health sciences [9 responses]
- Bachelor's degree in biomedical or health sciences [4 responses]
- Master's degree in biomedical or health sciences [11 responses]

**Executive Certificate of Advanced Study: Academic Content**

- Biomedical and health sciences information resources [5 responses]
- Design, delivery, and evaluation of education in information management [4 responses]
- General knowledge of biomedical and health sciences [3 responses]
- Specialized knowledge in at least one biomedical discipline [2 responses]

**Executive Certificate of Advanced Study: Experiential Content**

- Site visits to health sciences libraries or information centers [8 responses]
- Site visits to health care settings [9 responses]

**Executive Certificate of Advanced Study: Prerequisites**

- Previous coursework in biomedical or health sciences [4 responses]
- Bachelor's degree in biomedical or health sciences [1 responses]
- Master's degree in biomedical or health sciences [14 responses]

**Ph.D. with Health Sciences Specialization: Academic Content**

- Advanced management skills [7 responses]
- Biomedical and health sciences information resources [2 responses]
- General knowledge of biomedical and health sciences [3 responses]
- Specialized knowledge in at least one biomedical discipline [4 responses]

**Ph.D. with Health Sciences Specialization: Prerequisites**

- Previous coursework or bachelor's degree in biomedical or health sciences [8 responses]

**New questions and response options are indicated in brackets within the Delphi-2 instrument**

Delphi Survey:
Round Two

**Program: Master's Degrees in Library Science/Information Science with Health Sciences Specialization**

The master's degree programs prepare students for professional employment in library service and the information industry. They will be compatible, in their general requirements, with the requirements of a non-specialized master's degree in library science/information science. It is expected that students in these programs will enter a career in health sciences librarianship and/or information management.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the M.S. in Library Science/Information Science with Health Sciences Specialization.

A. Academic Content: The core curriculum for the master's degrees in library science/information science consists of five introductory courses, one each in communication, information organization, information retrieval, systems design and evaluation, and management, in addition to a large number of electives. From the following general areas of knowledge, please circle THREE that you consider MOST important to add to the education of the new master's degree candidate with health sciences specialization.

1. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
40 (74.1%)[1]

2. Biomedical and health sciences information resources (e.g., current and historical resources, print and electronic formats, courseware, consumer health information)
45 (83.3%)

3. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
26 (48.1%)

4. Creation, management and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
24 (44.4%)

5. Research methods
5 (9.3%)

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[1]N=54

6. Users' information needs and information seeking behaviors
22 (40.7%)

II. Program Design -- In this section, questions address particular aspects of the proposed program.

A. Prerequisites: The master's degree requires a bachelor's degree in any discipline as a prerequisite. An additional prerequisite is the demonstration of basic computer literacy. Please circle ONE additional prerequisite that you consider MOST important to the education of a new master's degree candidate.

1. No additional prerequisites
18 (33.3%)

2. Previous coursework in basic or health-related sciences
17 (31.5%)

3. Previous work experience in a health care setting
15 (27.8%)

4. Previous work in a library
4 (7.4%)

B. Structure: Please circle option a or b for the choice you consider MOST desirable for each of the following issues.

1. Length of program
   a. Current length of the program (16 courses)
   35 (64.8%)

   b. Expanded length (17-21 courses)
   17 (31.5%)

2. Internship/field experience should be
   a. Required.
   48 (88.9%)

   b. Not required
   5 (9.3%)

3. Thesis or research paper as a final product
   a. Required
   32 (59.3%)

b. Not required
20 (37.0%)

**Program: Advanced Internship Program**

The Advanced Internship Program would provide a worksite-based internship to expose new and experienced professionals to practices and technologies in health information management. The program would be customized to meet the educational needs of the individual with flexibility in the choice of sites and environments. It would provide the opportunity to develop expertise in a set of skills or a specialized area. The audiences for the Advanced Internship Program include new and mid-career professionals from a wide range of backgrounds.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or skills that would result from the Advanced Internship Program experience.

A. Experiential Content: The Advanced Internship Program is intended to be flexible and to be tailored to the needs and interests of a particular intern. Given this flexibility, please circle ONE option for the choice you consider MOST desirable for each of the following issues.

1. A special project
   a. Is a required part of the supervised work experience
   46 (85.2%)

   b. Is not a required part of the supervised work experience
   7 (13.0%)

2. Attendance at a professional meeting
   a. Is required
   28 (51.9%)

   b. Is not required
   24 (44.4%)

B. Academic Content: Given the primacy of experiential content in an internship program, please indicate your opinion of the importance of formal coursework.

1. Academic coursework should
   a. Be a required part of the Advanced Internship Program
   32 (59.3%)

   b. Not be a required part of the Advanced Internship Program
   22 (40.7%)

2. If you selected 1a. above, please indicate up to two areas of coursework you consider most essential.

   a. General computer science/systems design
   8 (14.8%)

   b. Medical informatics
   23 (42.6%)

   c. Management skills
   5 (9.3%)

   d. Research methods
   8 (14.8%)

   e. Introduction to health sciences librarianship and reference sources
   9 (16.7%)

II. Program Design -- In this section, questions address particular aspects of the proposed program.

A. Prerequisites: Please circle TWO prerequisites that you consider MOST important to an internship in health sciences information.

1. Master's degree in library or information science
   41 (75.9%)

2. General knowledge of biomedical or health sciences
   17 (31.5%)

3. At least one year of professional experience in a health sciences library or information management setting
   25 (46.3%)

4. Candidate's statement of purpose
   18 (33.3%)

B. Structure: Please circle ONE option for the choice you consider most desirable for each of the following issues.

1. Length of program

   a. 6 months
   39 (72.2%)

   b. 12 months
   14 (25.9%)

2. Final report should be
   a. Required
      52 (96.3%)

   b. Not required
      2 (3.7%)

3. Required-attendance seminar(s) should be
   a. Part of the Advanced Internship Program
      37 (68.5%)

   b. Not part of the Advance Internship Program
      15 (27.8%)

**Program: Certificate of Advanced Study (CAS) with Health Sciences Specialization**

The Certificate of Advanced Study (CAS) in Library and Information Science is a post-master's program that is designed for both new and experienced practitioners who seek an articulated and systematic continuing education program to enhance their professional career development. For students pursuing this certificate, emphasis in the program would be placed on health sciences information management. It is expected that students will use this program to redirect their career paths or to update their skills.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the CAS with Health Sciences Specialization.

A. Academic Content: Please circle THREE of the following areas of knowledge that you consider MOST important to the certificate program for health sciences information professionals.

1. Creation, management, and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
   39 (72.2%)

2. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
   22 (40.7%)

3. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
   46 (85.2%)

4. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
22 (40.7%)

5. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
22 (40.7%)

6. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
9 (16.7%)

B. Experiential Content: Please circle TWO from the following experiential opportunities that you consider MOST important to the successful CAS participant.

1. A major site-related project in a health sciences information setting (e.g., schools, hospitals, HMOs, corporate centers)
49 (90.7%)

2. A set of smaller site-related projects in one or more health sciences information settings
31 (57.4%)

3. Site visits to health sciences information settings
11 (20.4%)

4. "Virtual" site visits to health sciences information settings via videotapes or the World Wide Web
8 (14.8%)

5. Participation in a professional meeting
7 (13.0%)

II. Program Design -- In this section, questions address particular aspects of the proposed program.

A. Prerequisites: Candidates for the CAS may come from a variety of academic and work backgrounds. Please circle up to TWO prerequisites that you consider MOST important to the successful CAS participant.

1. Master's degree in any field
11 (20.4%)

2. Master's degree in library or information science
36 (66.7%)

3. Previous work experience in a library or information management setting
34 (63.0%)

4. Previous work experience in a health care setting
13 (24.1%)

5. No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study
11 (20.4%)

B. Structure: Please circle a or b for the choice you consider MOST desirable for the following issue.

1. Program content
   a. Each student's program completely individualized to address student's interests and needs.
   17 (31.5%)

   b. A common core of courses supplemented with courses to address individual students' interests and needs.
   37 (68.5%)

**Program: Executive Certificate of Advanced Study with Health Sciences Specialization**

The Executive Certificate of Advanced Study (ECAS) is a post-master's program for experienced information professionals that will include a combination of work on campus and at the individual's own work site. It will provide opportunities to prepare for an executive or administrative position, as well as to enrich and strengthen existing capabilities, to develop a subject or functional specialty, or to redirect a career path. It differs from the CAS in its focus on executive-level preparation for the experienced professional. It will include exposure to a variety of health care settings and to leaders in the field of health sciences information management. The ECAS will use information and communications technology to combine campus and off-site work experiences and academic content. Participants may remain at their work sites while attending classes, completing assignments, or communicating with one another electronically, between meeting together on campus at certain intervals.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the ECAS with Health Sciences Specialization.

A. Academic Content: Please circle THREE of the following areas of knowledge that you consider MOST important to the executive certificate program for health sciences information professionals.

1. Advanced management skills (e.g., human resources, planning, financial management, marketing, economics of information)
49 (90.7%)

2. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
15 (27.8%)

3. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
35 (64.8%)

4. Creation, management and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
19 (35.2%)

5. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
23 (42.6%)

6. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
20 (37.0%)

B. Experiential Content: Please circle TWO from the following experiential opportunities that you consider MOST important to the successful ECAS participant.

1. A major site-related project in a health sciences information setting (e.g., schools, hospitals, HMOs, corporate centers)
48 (88.9%)

2. A set of smaller site-related projects in one or more health sciences information settings
24 (44.4%)

3. Site visits to health sciences information settings
19 (35.2%)

4. "Virtual" site visits to health sciences information settings via videotapes or the World Wide Web
11 (20.4%)

II. Program Design -- In this section, questions address particular aspects of the proposed program.

A. Prerequisites: Candidates for the ECAS may come from a variety of academic and work backgrounds. Please circle ONE prerequisite that you consider MOST important to the successful ECAS participant.

1. Master's degree in library or information science
33 (61.1%)

2. Previous work experience in a library or information management setting
   13 (24.1%)

3. Previous work experience in a health care setting
   2 (3.7%)

4. No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study.
   13 (24.1%)

B. Delivery Method: The consensus of the first round was that 10 courses over a period of two years was the most desirable structure for the ECAS. It was also agreed that a combination of on-campus courses and off-campus, remote classes was appropriate. It is assumed that on-campus time in a program such as this for working professionals should be kept at a manageable level. Based on 102 hours per course for instruction and preparation time, a total of 510 hours each year (1020 total) would be required for 10 courses over the two-year period. These questions address the issue of how much time participants and employers would be willing to commit to the on-campus experience and how much of the program could be handled through distance learning experiences.

Please circle ONE option for the choice you consider MOST desirable for each of the following issues.

1. Of the total expected 510 hours for each of the two years, how many hours should participants spend on campus annually? (You may assume 8 hour days; 96 hours represents 12 complete days each year.)
   a. 96 hours
      19 (35.2%)

   b. 128 hours
      19 (35.2%)

   c. 168 hours
      11 (20.4%)

   d. 256 hours
      3 (5.6%)

   e. Other (specify):
      2 (3.7%)

2. On-campus time should be:
   a. Periodic weekdays
      4 (7.4%)

b. Periodic half-days on weekdays
1 (1.9%)

c. Periodic weekends
19 (35.2%)

d. Summer institutes
13 (24.1%)

e. Periodic weekday evenings
1 (1.9%)

f. Other or combination (specify)
14 (25.9%)

3. Certain components of a course could be delivered on campus more successfully than others; other components could be delivered successfully at a distance. Please circle TWO distance learning experiences you consider MOST desirable.

a. Scheduled teleconferences
30 (55.6%)

b. Ongoing electronic discussions
32 (59.3%)

c. Online assignments
24 (44.4%)

d. Virtual site visits
9 (16.7%)

e. Lectures by faculty or guest speakers
12 (22.2%)

C. Structure: Please circle ONE option for the choice you consider MOST desirable for the following issue.

1. Special project(s)

a. Collaborative projects drawing on the students' varied backgrounds and experiences
29 (53.7%)

b. Individual projects based on the individual student's interests and needs
25 (46.3%)

**Program: Ph.D. with Health Sciences Specialization**

The purpose of the doctoral program in the School of Information and Library Science is to educate scholars who are capable of addressing problems of scholarly consequence in the fields of information and library science. Graduates of the program are prepared to conduct productive, independent, and scholarly research in universities, government agencies, and other institutions in which issues of information communication and retrieval are addressed.

I. Program Content -- In this section of the questionnaire, questions address the desired competencies or areas of knowledge that would result from the Ph.D. with Health Sciences Specialization.

A. Academic Content: The Ph.D. requires at a minimum one basic seminar in information retrieval, another on scholarly communication, two statistics courses, and a dissertation. From the following areas of knowledge, please circle THREE that you consider MOST important to add to the core of requirements for the successful doctoral candidate in health sciences information management.

1. Research skills (e.g., research methods, statistical analysis, qualitative analysis)
42 (77.8%)

2. Design and evaluation of information services and programs (e.g., needs assessment, outcomes measurement, benchmarking, evaluation of technologies)
27 (50.0%)

3. Creation, management and use of health information systems (e.g., integrated health information systems, computer-based patient records, decision support systems, coding and thesaural systems for information organization and retrieval)
21 (38.9%)

4. Design, delivery, and evaluation of education in information management (e.g., instructional design, cognitive psychology)
14 (25.9%)

5. The role of professional education and of graduate education in the current academic environment (e.g., teaching, research, and service responsibilities)
6 (11.1%)

6. Advanced communications and presentation skills (e.g., graphic presentation, proposal development)
9 (16.7%)

7. Health care environment (e.g., trends affecting the design and delivery of health care, biomedical research, health sciences education)
6 (11.1%)

8. Advanced systems design and networking (e.g., database systems, interface design, telecommunications)
5 (9.3%)

9. Medical informatics (e.g., medical decision making, clinical information systems)
27 (50.0%)

B. Experiential Content: Please circle ONE from the following experiential opportunities that you consider MOST important to the education of the doctoral student in health sciences information management.

1. Research practicum
47 (87.0%)

2. Field experience in a health sciences library or information center, or in another health information setting (e.g., health care delivery site, biomedical research or education setting, or corporate environment)
5 (9.3%)

3. Experience with college or university teaching
3 (5.6%)

II. Program Design -- In this section, questions address particular operational aspects of the proposed program.

A. Prerequisites: Please circle from the following list TWO prerequisites you consider MOST important for an incoming doctoral student.

1. Master's degree in library or information science
45 (83.3%)

2. Previous work experience in a library or information management setting
27 (50.0%)

3. Master's degree in biomedical or health sciences
9 (16.7%)

4. Previous work experience in a health care setting
9 (16.7%)

5. No specific prerequisites, but the individual should demonstrate through a combination of coursework and experience a readiness for advanced study
10 (18.5%)

**Overview of Programs**

The results of the study will be used to help to determine which of the program should be offered by the University of North Carolina at Chapel Hill. Therefore, your comments below on the comparative value and role of each of the programs will be helpful.

1. Please estimate the value of each of the five programs in terms of contribution to the preparation of tomorrow's health sciences librarians.

| | Low Value | | | | High Value |
|---|---|---|---|---|---|
| Master's with Health Sciences Specialization | 1 | 2 | 3 | 4 | 5 |

EAG average: 4.0
Employer average: 4.4
Mid-career average: 4.3
Combined average: 4.2

| | | | | | |
|---|---|---|---|---|---|
| Advanced Internship Program | 1 | 2 | 3 | 4 | 5 |

EAG average: 3.7
Employer average: 4.2
Mid-career average: 3.7
Combined average: 3.8

| | | | | | |
|---|---|---|---|---|---|
| Certificate of Advanced Study | 1 | 2 | 3 | 4 | 5 |

EAG average: 3.4
Employer average: 3.7
Mid-career average: 3.6
Combined average: 3.6

| | | | | | |
|---|---|---|---|---|---|
| Executive Certificate of Advanced Study | 1 | 2 | 3 | 4 | 5 |

EAG average: 3.8

Employer average: 3.8
Mid-career average: 4.0
Combined average: 3.9

PhD with Health Sciences Specialization

1 2 3 4 5

EAG average: 4.4
Employer average: 3.5
Mid-career average: 3.6
Combined average: 3.9

2. Please provide any additional comments regarding the proposed programs and the preparation of tomorrow's health sciences librarians in the space following.

## Qualitative Data from Delphi Two

**Master's Structure**

MC-22 [Thesis] -- "Perhaps optional in place of coursework, i.e. 6 credits."

MC-26 "Thesis or internship should be required."

**AIP Experiential Content**

EAG-6 [Attendance at a professional meeting] -- "Optional, based on previous attendance/nonattendance."

MC-15 [Special project] – "outgrowth of statement of purpose."

MC-15 [Attendance at a professional meeting] – "if at all feasible."

**AIP Academic Content**

MC-15 [Academic coursework should be a required part of the AIP] "But delivered remotely."

MC-19 [Research methods] "and experience conducting a project."

MC-24 [Required coursework] "Tailor to needs of individual."

E-9 [Required coursework] "Depends on focus of internship and background of student."

**AIP Prerequisites**

EAG-1 "1 mandatory, plus 2 or 3."

**AIP Structure**

E-10 "9 months" [length of program, instead of 6 or 12 months]

**CAS Academic Content**

E-4 "A different set would be important depending on the student's interest in pursuing a content/technical career path in which case 1,2,3 would be appropriate or a management career path in which case 4,5,6 would be most important."

**CAS Experiential Content**

MC-10 [Participation in a professional meeting] "Not part of curriculum, but an expectation of all participants."

MC-15 [A major site-related project or a set of smaller site-related projects]

**CAS Structure**

MC-15 "I think elements of B [common core of courses] are needed, but B would be a faculty-based approach that might not teach essential topics due to a lack of faculty expertise rather than a lack of need for the teaching of that expertise."

**ECAS Experiential Content**

MC-15 "4 and (1 or 2 or 3)" [Virtual site visits and a major project or set of smaller projects or site visits]

E-6 [Virtual site visits] "Optional, at student's interest"

E-19 [Set of smaller projects] = 1st choice; [Major site-related project] = 2nd choice

**ECAS Delivery**

EAG-2 "Offer options of periodic weekends or summer institute."

EAG-6 "Half periodic weekends and about half 1 week stretch."

EAG-9 "I hate teleconferences."

MC-1 "Periodic weekends and weekday evenings."

MC-4 "C and D" [Periodic weekends and summer institutes]

MC-7 "192 hours" [spent on campus annually]

MC-7 "Combination b and c or e." [Periodic half-days on weekdays and periodic weekends or periodic weekday evenings]

MC-10 "Weekends and weeklong intensives"

MC-10 "B and C would be integral to the program, wouldn't they?" [ongoing electronic discussions and online assignments]

MC-14 "(A or B or C) and D" [Periodic weekdays or periodic half-days on weekdays or periodic weekends AND summer institutes]

MC-15 "48" [hours of the total spent on campus annually]

MC-15 "3-day institutes at the end of each year."

MC-15 "Year-end institutes – whenever that is."

MC-15 [Lectures by faculty or guest lectures] "Perhaps using RealAudio or its ilk with online notes and Q&A time."

MC-21 "Evening and weekends"

MC-23 "Combination of C and D" [Periodic weekends and summer institutes]

E-9 "Concentrated institute over successive days or periodic weekends."

E-15 "Lectures could be delivered by teleconferencing or via videotapes."

E-19 [168 hours on campus] "4 weeks, possibly. Two per time."

E-19 "If you have students beyond N.C. consider 2 wk courses. For (1) consistency and (2) to establish a connectedness with students/faculty and student/student. I believe that ½ days here and there do not connect a student to anything."

E-22 "Periodic institute plus periodic weekends."

E-25 "Weekdays or weekday evenings and weekends."

**ECAS Structure**

MC-15 "A [collaborative projects] is my preference, but B [individual projects] might be necessary based on the details of who is enrolled."

**PhD Academic Content**

EAG-7 "Others will depend on special interests of the candidate."

**PhD Experiential Content**

EAG-7 "Both [research practicum and teaching experience] are important."

**PhD Prerequisites**

EAG-1 "Require a master's, but either option 1 or 3 in addition to experience."

EAG-7 [Master's in LIS] "or other relevant master's."

**Overview**

EAG-3 "In these days of busy lives, it is valuable for students to have a variety of educational formats from which to choose."

EAG-7 "These are all worthy programs and it is difficult to differentiate among them in terms of importance. With the aging of the workforce it is important that we create opportunities such as the internship, certificate and executive certificate programs. The PhD program is also essential to ensure a supply of high quality faculty. The foundation for attracting master's students in the first place is, of course, the health sciences specialization. I expect the answer lies in the resources available to mount these programs."

EAG-8 CAS: "A primary vehicle for continuing education and advancement for information professionals."

EAG-8 ECAS: "May be unnecessary duplication of what's available in health management executive programs, combined with CAS."

EAG-8 PhD: "Don't need to educate as many, but they are a source of new ideas and innovation within other programs – as well as the generators of new knowledge in the field."

MC-4 "Despite having worked as a health sciences librarian for more than fifteen years, health care colleagues don't view medical librarianship as a specialty. We need to do more to promote/publicize medical librarianship as a career choice."

MC-5 PhD: "Limited employment opportunities."

MC-5 "It's disheartening to see the number of hospitals that are cutting back or eliminating professional library staff. I don't think these advanced programs will help those librarians. Probably only the medical school librarians will be able to take advantage of these programs. More needs to be done to help librarians obtain and keep their jobs in health care organizations."

MC-10 Master's: "Less important than the certificate/internship because MLS has and remains entry level requisite for health science library positions, H.S. specialization desirable but it is possible to learn biomed aspects OJT [on the job training?]"

MC-10 PhD: "This will never be an option for the mainstream biomed librarian. Whereas adv intern and certificate programs might have more widespread, practical appeal."

MC-15 "I think the AIP, CAS and ECAS are too many divisions between the master's and PhD programs. The ECAS seems a water-down test for PhD. In some sense, the AIP seems a call for mandatory CE. Perhaps going with one certificate program and developing a series of distant-deliverable accredited CE."

| | |
|---|---|
| MC-17 | CAS: "I don't see a clear distinction between the CAS and the ECAS." |
| MC-17 | PhD: "Outside of teaching in a library school, I don't see much future in this." |
| MC-17 | "I think the real value of these proposed programs would be in the confidence a prospective health sciences employer would have in hiring a Master's graduate with Health Sciences Specialization." Also, I think the ECAS would provide an opportunity for a middle manager to gain the credentials to move into upper management (without having to be burdened with working on a Ph.D.)" |
| MC-19 | "I would prefer to see a D.L.S. program developed (equivalent to the Ed.D.) rather than the Exec. Cert." |
| MC-23 | "I suggest that some provision be made to educate and prepare medical historians and curators of medical history collections. Additionally, medical librarians, especially in the master's and internship programs, should receive instruction on sources of information regarding the influence of work and the environment on health, as well as sources on alternative medical practices, ethnobotany, and medical anthropology." |
| E-4 | "Since in an academic health sciences environment, one can choose either a content/research/skill based career path, e.g. advancing in rank without administrative responsibility OR one can choose a management career path, e.g. director, two somewhat different educational outcomes and thus selection of coursework and experience are possible. Perhaps, like in education, there should be the Ph.D. in LIS – a research degree – and a D.LIS., an applied or management oriented degree." |
| E-6 | Master's: "This is far and away the most important program. Concentrate your resources here." |
| E-6 | AIP: "Dilutes resources without providing a rigorous course of study." |
| E-6 | CAS: "Dilutes resources without providing a rigorous course of study." |
| E-6 | ECAS: "Dilutes resources on what appears to be a very weak course of study." |
| E-6 | PhD: "The doctoral program can be of immense value if it is provided with adequate resources and accepts a limited number of excellent candidates." |
| E-6 | "Internships and certificate programs represent watered-down versions of the disciplined course of study required for degree programs. They produce individuals with pseudo credentials for a work environment that increasingly requires a comprehensive education. At the same time, these programs diminish the value of the MLS and PhD to some extent and would almost certainly divert resources from the core programs." |

| | |
|---|---|
| E-6 | "Perhaps the coursework suggested for the CAS and executive programs could be incorporated as curriculum tracks within the degree programs." |
| E-6 | "Do not assume that healthcare systems can afford to accommodate students for internships or practical experiences without adequate compensation. Many of us are tired of programs where the school collects and keeps the tuition while we do all the work." |
| E-9 | AIP: "Will the time and cost pay off for individuals pursuing this option? How?" |
| E-9 | ECAS: "Value depends on perception of employers, however." |
| E-9 | PhD: "Could promote needed research." |
| E-15 | Master's: "I'm optimistic. I hope by having this specialization at the MLS level that the best and brightest will choose health sciences libraries early in their careers." |
| E-15 | AIP: "This is a great way to redirect those who didn't start out in health sciences libraries." |
| E-15 | CAS: "I see these [CAS and ECAS] as excellent opportunities for more experienced librarians." |
| E-15 | ECAS: "My only concern about this one is that it could overlap too much with the CAS program. In other words, why would anyone choose the CAS program if they could qualify for the more prestigious-sounding "Executive CAS?" |
| E-19 | "Either AIP or CAS not both, some combination." |
| E-19 | PhD: "Based on the contribution to the preparation of tomorrow's hsl statement, value high but not many needed." |
| E-19 | "This survey is very nicely organized." |
| E-21 | ECAS: "Many would benefit from this opportunity." |
| E-21 | PhD: "Research methodology is key here. Others offer." |

E-25 "Specialists will need a business toolkit because more health care (hospitals, clinics, doctor practices) is moving into the business arena."

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

January 6, 1997

Dear Colleague:

You have been selected to participate in a study on the level of demand for a possible health sciences specialization in the master's programs of the School of Information and Library Science. You were chosen to be part of this study because you applied to a master's degree program in one of the North or South Carolina library and information science schools.

Please return the survey to me, along with the required consent form, in the return envelope which is provided. PLEASE SEND IT BY JANUARY 27, or as soon as possible. You are part of a small sample whose input will help us decide on the possible implementation of the program.

The code on the questionnaire will allow us to follow up on surveys not returned; responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

**Preparing Tomorrow's Health Sciences Librarians:**
**Marketing Study**

## Consent Form

You have been asked to participate in a marketing study to determine the level of market demand for educational programs for health sciences librarianship and health information management. The information will be used to assess the feasibility of offering the programs.

The study will consist of one questionnaire. The questionnaire will provide descriptions of one to five educational programs. You will be asked about your potential interest in the programs and about factors which would affect your decision to consider the programs as a student or as an employer of graduates of the programs. The time required to respond to the questionnaire will vary according to the number of programs included in the questionnaire you receive, but it should require no more than 45 minutes. Your responses will remain anonymous.

Participation in the study is voluntary. You may withdraw your consent and withdraw from the study at any time.

If you have any questions or concerns that arise in connection with your participation in this study, you should contact Barbara Moran at 919-962-8366. You also may contact the UNC Academic Affairs Institutional Review Board if you have questions or concerns about your rights as a research subject (contact Frances A. Campbell, Chair, AA-IRB Office, CB#4100, 300 Bynum Hall, UNC-CH, Chapel Hill, NC 27599-4100, 919/966-5625).

_____ _____

Date Signature

* This consent form was also sent to recipients of the marketing surveys targeting paraprofessionals, mid-career information professionals and employers (Appendices G-I).

# Applicants Survey Report
**5/1/97**

**Response Rate:**

| | |
|---|---|
| 69 | Returned and non-blank surveys |
| 3 | Returned due to expired forwarding address |
| 1 | Returned with expressed refusal |
| 126 | Surveys sent out |

University of North Carolina
25/(42-1)=61.0%

University of South Carolina
23/(42-1)=56.1%

North Carolina Central University
21/(42-1)=51.2%

Total Applicants
69/(126-3)=56.1%

*Total Response Rate*: 69 Returned and non-blank / (126 Surveys sent out – 3 unforwarded ) =
**56.1%**

1. Are you presently enrolled in an LIS program?

| | | |
|---|---|---|
| ❑ Yes | **65** | **(94.2%)** |
| ❑ No | **4** | **(5.8%)** |

2. When you were making your decision about whether or not to enroll in an LIS program, what factors influenced your decision? *Please indicate how important each of the following factors were.*

| | | Very important | Important | Less important | Not applicable | MISSING |
|---|---|---|---|---|---|---|
| A | Availability of a part-time program | 36(52.2%) | 10(14.5%) | 15(21.7%) | 6(8.7%) | 2(2.9%) |
| B | Availability of dependent family care assistance | 1(1.4%) | 2(2.9%) | 19(27.5%) | 46(66.7%) | 1(1.4%) |
| C | Consistency of content with career goals | 50(72.5%) | 18(26.1%) | 0 | 0 | 1(1.4%) |
| D | Cost of program | 33(47.8%) | 31(44.9%) | 3(4.3%) | 1(1.4%) | 1(1.4%) |
| E | Diversity of student body | 5(7.2%) | 17(24.6%) | 44(63.8%) | 2(2.9%) | 1(1.4%) |
| F | Financial aid offered by school | 25(36.2%) | 18(26.1%) | 18(26.1%) | 7(10.1%) | 1(1.4%) |
| G | Flexible schedule and availability of night courses | 45(65.2%) | 15(21.7%) | 8(11.6%) | 1(1.4%) | 0 |
| H | General reputation of the program | 41(59.4%) | 21(30.4%) | 5(7.2%) | 1(1.4%) | 1(1.4%) |
| I | Geographic proximity to home | 46(66.7%) | 15(21.7%) | 7(10.1%) | 1(1.4%) | 0 |
| J | Library and computer lab resources | 32(46.4%) | 24(34.8%) | 11(15.9%) | 2(2.9%) | 0 |
| K | Opportunity for professional involvement such as conferences and participation in research projects | 8(11.6%) | 31(44.9%) | 26(37.7%) | 3(4.3%) | 1(1.4%) |
| L | Recommendation from a relative, alumni, current student, or employer | 11(15.9%) | 17(24.6%) | 30(43.5%) | 10(14.5%) | 1(1.4%) |
| M | Research reputation of faculty | 5(7.2%) | 22(31.9%) | 34(49.3%) | 7(10.1%) | 1(1.4%) |
| N | Size of classes | 7(10.1%) | 28(40.6%) | 30(43.5%) | 3(4.3%) | 1(1.4%) |
| O | Teaching reputation of faculty | 15(21.7%) | 35(50.7%) | 15(21.7%) | 3(4.3%) | 1(1.4%) |
| P | Other (*Please specify*): | 7(10.1%) | | | | 62(89.9%) |

Which of the above factors were **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

| | |
|---|---|
| **a** | **22** |
| b | 0 |
| **c** | **20** |
| **d** | **23** |
| e | 3 |
| f | 12 |
| **g** | **30** |
| **h** | **25** |
| **i** | **35** |
| j | 8 |
| k | 3 |
| l | 2 |
| m | 1 |
| n | 1 |
| o | 4 |
| p | 4 |

3. If you are presently enrolled in an LIS program, how are you meeting the costs of that program? *Check any that apply.*

| | | | |
|---|---|---|---|
| ❑ Personal or family support | **1[1]=29(42.0%)** | **0=36(52.2%)** | **Missing=4(5.8%)** |
| ❑ Fellowship or scholarship | **1=9(13.0%)** | **0=56(81.2%)** | **Missing=4(5.8%)** |
| ❑ Graduate assistantship | **1=11(15.9%)** | **0=54(78.3%)** | **Missing=4(5.8%)** |
| ❑ Part-time job | **1=22(31.9%)** | **0=43(62.3%)** | **Missing=4(5.8%)** |
| ❑ Full-time job | **1=22(31.9%)** | **0=43(62.3%)** | **Missing=4(5.8%)** |
| ❑ Loans | **23(33.3%)** | **0=42(60.9%)** | **Missing=4(5.8%)** |
| ❑ Other (please specify): | | | |

4. If the health sciences specialization program described on the previous page had been available when you were applying, would it have been of interest to you?

| | | |
|---|---|---|
| ❑ Yes | **17** | **(24.6%)** |
| ❑ Probably not, because: | **50** | **(72.5%)** |
| **Missing** | **2** | **(2.9%)** |

[1] Selection of this option was coded as "1." Non-selection of this item was coded as "0."

## *Demographic questions*

5. What is your gender?

| | | |
|---|---|---|
| ❑ Female | 61 | (88.4%) |
| ❑ Male | 8 | (11.6%) |
| **Missing** | 0 | |

6. What is your age?

| | | |
|---|---|---|
| ❑ 20-25 | 13 | (18.8%) |
| ❑ 26-30 | 16 | (23.2%) |
| ❑ 31-35 | 10 | (14.5%) |
| ❑ 36-40 | 9 | (13.0%) |
| ❑ 41-45 | 12 | (17.4%) |
| ❑ 46-50 | 3 | (4.3%) |
| ❑ 51-55 | 4 | (5.8%) |
| ❑ 56-60 | 2 | (2.9%) |
| ❑ 61 or greater | 0 | |
| **Missing** | 0 | |

7. What academic degrees have you *already* completed?

| | Year Completed | Subject Area |
|---|---|---|
| ❑ BA/BS | 1=66(95.7%) 0=1(1.4%) | Missing=2(2.9%) |
| ❑ Master's | 1=18(26.1%) 0=50(72.5%) | Missing=1(1.4%) |
| ❑ Ph.D. | 1=(1.4%) 0=68(98.6%) | Missing=0 |

8. Of which professional associations are you a member?

| | | |
|---|---|---|
| ❑ Medical Library Association | | 0=69(100%) |
| ❑ American Library Association | 1=15(21.7%) | 0=54(78.3%) |
| ❑ Special Libraries Association | 1=2(2.9%) | 0=67(97.1%) |
| ❑ American Society for Information Science | 1=1(1.4%) | 0=68(98.6%) |
| ❑ Other (please specify): | | |

9. How many years of library experience do you have?

| | |
|---|---|
| ❑ None | 28(40.6%) |
| ❑ Less than 2 years | 24(34.8%) |
| ❑ 2-5 years | 15(21.7%) |
| ❑ 6-10 years | 1(1.4%) |
| ❑ More than 10 years | 1(1.4%) |

**Applicants' Other Factors (Question 2P)**

Program requirements

Kindness and reception shown me when I came to visit the INLS dept

Content of course

Taught via distance ed

ALA accredited

ALA accredited

Potential earnings

**Applicants' Reasons for No Interest in Proposed Program (Question 4)**

I'm more interested in the humanities

I am interested in children's services

I have no background/training in that area

My interest is in information retrieval in all settings, not just health sciences

I am not interested in that area

I'm not interested in the field

I wasn't interested in a specialized program and my science background is rather weak

I'm not interested in the health sciences field

[...not in subject interest...]

I am not interested in working in health sciences

No interest in health/med sciences

I have no interest in health science

I am primarily interested in public libraries and lack a science background

I have little interest in the health sciences

Not related to my career goals

I would be interested but I have a social science degree

I don't have an interest in health sciences

I want to specialize in business information system

I am employed in public school system

Thesis is required

I am not interested in that field -- I'm interested in school media

I am interested in school librarianship

Cost too much

I am interested in public services in an academic library

I am interested in tech services

Science is my worst subject

I am pursuing academic library specialization

I do not want to go into the health sciences information field

I am satisfied with my career and am taking the program to increase the services I offer my clients

I am in school library media

Seeking ed technology related position

I'm interested in public libraries

I had/have a specific career goal in mind. I intend to become a public children's librarian and eventually a bookmobile librarian

My interest lies in the humanities

I'm already into education programs

Public school career focus

I am afraid a lot of medical knowledge would be required

I'm specializing my education to become a school media coordinator

Not area of interest

It does not apply to elementary school

Not interested in that specialty

Interested in children's services

I want to continue working with children

I am interested in children's services

I want to work in an ordinary library

Not interested in that field

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

January 6, 1997

Dear Colleague:

We are conducting a study on the level of demand for a possible health sciences specialization in the master's programs in the School of Information and Library Science. Our sample of prospective students in this study includes paraprofessionals working in health sciences libraries in the region. I am asking your assistance in distributing the enclosed surveys to four paraprofessionals in your library. These staff members should have a bachelor's degree. You may also give preference to persons who have expressed interest in a career in librarianship.

The survey, a cover letter, required consent form, and return envelope are enclosed for each staff member. The staff member should return the survey directly to the University of North Carolina, as indicated on the envelope. I ask your help in getting the surveys to the staff members as quickly as possible.

I am also enclosing a postcard for you to complete to allow follow up directly with your staff member. Please indicate the names of the persons and return it to me. This is only for follow up on surveys not returned; all responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
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January 6, 1997

Dear Colleague:

We are conducting a study on the level of demand for a possible health sciences specialization in the master's programs in the School of Information and Library Science. Our sample of prospective students in this study includes paraprofessionals working in health sciences libraries in the region. I am asking your assistance in distributing the enclosed survey to one paraprofessional in your library. This staff member should have a bachelor's degree. You may also give preference to a person who has expressed interest in a career in librarianship.

The survey, a cover letter, required consent form, and return envelope are enclosed for the staff member. The staff member should return the survey directly to the University of North Carolina, as indicated on the envelope. I ask your help in getting the survey to the staff member as quickly as possible.

I am also enclosing a postcard for you to complete to allow follow up directly with your staff member. Please indicate the name of the person and return it to me. This is only for follow up on surveys not returned; all responses will be anonymous during the analysis of data.

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Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
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Phone# (919) 962-8366
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The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

January 6, 1997

Dear Colleague:

You have been selected to participate in a study on the level of demand for a possible health sciences specialization in the master's programs of the School of Information and Library Science. You were chosen to be part of this study because you are now working as a paraprofessional in a health sciences library in the region.

Please return the survey to me, along with the required consent form, in the return envelope which is provided. PLEASE SEND IT BY JANUARY 27, or as soon as possible. You are part of a small sample whose input will help us decide on the possible implementation of the program.

The code on the questionnaire will allow us to follow up on surveys not returned; responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

# Paraprofessionals Survey Report
5/1/97

**Response Rate:**

| | |
|---|---|
| **80** | Returned and non-blank surveys |
| 2 | Returned blank |
| 4 | Returned by an academic employer who refused participation |
| 141 | Surveys sent out |

Hospital paraprofessionals
10/25=40.0%

Academic paraprofessionals
70/116=60.3%

*Total Response Rate:* 80 Returned and non-blank / (141 Surveys sent out) = **56.7%**

1. Are you interested in pursuing a master's degree in information/library science?

| | | |
|---|---|---|
| ❑ Yes (*answer the following questions*) | **50** | **62.5%** |
| ❑ No (*skip to question 5*) | **27** | **33.8%** |
| | ***Missing*: 3** | **3.8%** |

2. Please indicate how important each of the following factors would be to your decision to apply to a master's program in information/library science with health sciences specialization.

| | | Very important | Important | Less important | Not applicable | MISSING[1] |
|---|---|---|---|---|---|---|
| A | Availability of a part-time program | 36(45.0%) | 10(12.5%) | 3(3.8%) | 1(1.3%) | 30(37.5%) |
| B | Availability of dependent family care assistance | 8(10.0%) | 4(5.0%) | 15(18.8%) | 23(28.8%) | 30(37.5%) |
| C | Consistency of content with career goals | 36(45.0%) | 12(15.0%) | 1(1.3%) | 0 | 31(38.8%) |
| D | Cost of program | 36(45.0%) | 13(16.3%) | 1(1.3%) | 0 | 30(37.5%) |
| E | Diversity of student body | 5(6.3%) | 17(21.3%) | 25(31.3%) | 2(2.5%) | 31(38.8%) |
| F | Financial aid offered by school | 29(36.3%) | 17(21.3%) | 2(2.5%) | 2(2.5%) | 30(37.5%) |
| G | Flexible schedule and availability of night courses | 39(48.8%) | 11(13.8%) | 0 | 0 | 30(37.5%) |
| H | General reputation of the program | 17(21.3%) | 29(36.3%) | 2(2.5%) | 0 | 32(40.0%) |
| I | Geographic proximity to home | 30(37.5%) | 16(20.0%) | 4(5.0%) | 0 | 30(37.5%) |
| J | Library and computer lab resources | 28(35.0%) | 19(23.8%) | 2(2.5%) | 0 | 31(38.8%) |
| K | Opportunity for professional involvement such as conferences and participation in research projects | 10(12.5%) | 28(35.0%) | 12(15.0%) | 0 | 30(37.5%) |
| L | Recommendation from a relative, alumni, current student, or employer | 6(7.5%) | 19(23.8%) | 24(30.0%) | 1(1.3%) | 30(37.5%) |
| M | Research reputation of faculty | 10(12.5%) | 23(28.8%) | 16(20.0%) | 1(1.3%) | 30(37.5%) |
| N | Size of classes | 10(12.5%) | 23(28.8%) | 15(18.8%) | 2(2.5%) | 30(37.5%) |
| O | Teaching reputation of faculty | 17(21.3%) | 28(35.0%) | 4(5.0%) | 1(1.3%) | 30(37.5%) |
| P | Other (*Please specify*): | 3 | 1 | 0 | 0 | 76 |

[1] Respondents were instructed to skip questions 2, 3 and 4 if they responded "No" to question 1. This accounts for the frequency of "missing" responses.

Which of the above factors are **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

| | |
|---|---|
| **a** | **25** |
| b | 5 |
| **c** | **15** |
| **d** | **17** |
| e | 0 |
| **f** | **17** |
| **g** | **23** |
| h | 5 |
| **i** | **15** |
| j | 4 |
| k | 4 |
| l | 0 |
| m | 1 |
| n | 0 |
| o | 7 |

3. If you were to enroll in an LIS program, how would you be most likely to meet the costs of that program? *Check any that apply.*

| | | | |
|---|---|---|---|
| ❑ Personal or family support | **1[2]=23(28.8%)** | **0=27(33.8%)** | **Missing=30(37.5%)[3]** |
| ❑ Fellowship or scholarship | **1=24(30.0%)** | **0=26(32.5%)** | **Missing=30(37.5%)** |
| ❑ Graduate assistantship | **1=16(20.0%)** | **0=34(42.5%)** | **Missing=30(37.5%)** |
| ❑ Part-time job | **1=15(18.8%)** | **0=35(43.8%)** | **Missing=30(37.5%)** |
| ❑ Full-time job | **1=26(32.5%)** | **0=24(30.0%)** | **Missing=30(37.5%)** |
| ❑ Loans | **1=26(32.5%)** | **0=24(30.0%)** | **Missing=30(37.5%)** |
| ❑ Employer support | **1=19(23.8%)** | **0=31(38.8%)** | **Missing=30(37.5%)** |

4. Would you consider applying to this program that provides a master's with health sciences specialization?

| | |
|---|---|
| ❑ Yes | **38(49.4%)** |
| ❑ Probably not, because: | **11(13.8%)** |
| ***Missing:*** | **38(47.5%)** |

[2] Selection of this option was coded "1." Non-selection of this option was coded "0."
[3] Respondents were instructed to skip questions 2, 3 and 4 if they responded "No" to question 1. This accounts for the frequency of "missing" responses.

## *Demographic questions*

5. What is your gender?
   - ❑ Female **68(85.0%)**
   - ❑ Male **11(13.8%)**
   - ***Missing:*** **1(1.3%)**

6. What is your age?
   - ❑ 20-25 **5(6.3%)**
   - ❑ 26-30 **17(21.3%)**
   - ❑ 31-35 **10(12.5%)**
   - ❑ 36-40 **13(16.3%)**
   - ❑ 41-45 **14(17.5%)**
   - ❑ 46-50 **8(10.0%)**
   - ❑ 51-55 **8(10.0%)**
   - ❑ 56-60 **5(6.3%)**
   - ❑ 61 or greater **0**

7. What academic degrees have you ***already*** completed?

| | | Year Completed | Subject Area |
|---|---|---|---|
| ❑ BA/BS | **1=76(95.0%)** | **0=4(5.0%)** | **Missing=0** |
| ❑ Master's | **1=11(13.8%)** | **0=69(86.3%)** | **Missing=0** |
| ❑ Ph.D. | **1=0(0%)** | **0=80(100%)** | **Missing=0** |

8. Of which professional associations are you a member?
   - ❑ Medical Library Association **4**
   - ❑ American Library Association **2**
   - ❑ *State library association* **14**
   - ❑ Special Libraries Association **3**
   - ❑ American Society for Information Science **0**

9. How many years of library experience do you have?
   - ❑ Less than 2 years **9(11.3%)**
   - ❑ 2-5 years **14(17.5%)**
   - ❑ 6-10 years **24(30.0%)**
   - ❑ 11-15 years **10(12.5%)**
   - ❑ More than 15 years **23(28.8%)**

10. By what type of institution are you currently employed?
    - ❑ Academic health sciences center **66(82.5%)**
    - ❑ Government agency, including Veterans Administration **0**
    - ❑ Hospital **12(15.0%)**
    - ❑ Corporation **0**
    - ❑ Other (please specify): **2(2.5%)**

11. What is your current position? _____

12. What is your current salary? *Please convert to full-time equivalency.*
    - ❑Less than $20,000 **32(40.0%)**
    - ❑$20,000 - $25,000 **25(31.3%)**
    - ❑$25,001 - $30,000 **13(16.3%)**
    - ❑Greater than $30,000 **9(11.3%)**
    - **Missing** **1(1.3%)**

**Paraprofessionals' Other Factors (Question 2P)**

Relevancy to reality and library operations.

Accept transfer classes from other universities.

Assistance with career placement.

Availability of employer support -- financial and time; Practicum components of program; Credit for related work experience.

**Paraprofessionals' Reasons for No Interest in Applying (Question 4)**

Too far from home and place of employment

Location "out of state"

I would want as broad an experience as possible.

Personal preference is humanities, but there is value to taking specialized dgree program for those who are going to work in health sciences libraries.

I haven't decided that I want to be in this area that much longer.

Specialization in h.sci. not my interest.

Not my particular interest. I'm more interested in systems than in referençe or collection development.

I'm not interested in health sciences librarianship.

Want to pursue either school librarianship or children's librarianship.

My degrees are in humanities (English lit)

Health sciences would not be my first choice, and if this refers to a program at UNC, I am unable to relocate.

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CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

January 6, 1997

Dear Colleague:

We are conducting a study on the level of demand for possible new educational programs designed for the needs of mid-career information professionals desiring a specialization in the health sciences. You have been selected as part of a random sample of members of professional library and health information associations.

Please return the survey to me, along with the required consent form, in the return envelope which is provided. PLEASE SEND IT BY JANUARY 27, or as soon as possible. You are part of a small sample whose input will help us decide on the possible implementation of the programs.

The code on the questionnaire will allow us to follow up on surveys not returned; responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

# Mid-Career Survey Report
5/1/97

**Response Rate:**

96 Returned and non-blank surveys
8 Unforwarded
250 Surveys sent out

MLA
37/(75-3)=51.4%

ALA
28/(75-4)=39.4%

AHIMA
17/50=34.0%

ASIS
8/25=32.0%

SLA
6/(25-1)=25.0%

*Total Response Rate:* 96 Returned and non-blank/(250 sent out – 8 unforwarded) = **39.7%**

## Program 1:
## *Advanced Internship Program (AIP)*

A post-master's work-site-based internship to expose new and experienced professionals to innovative practices and technologies in health information management. Customized to meet the educational needs of the individual with flexibility in the choice of sites and environments.

- **Content emphasizes**: supervised work experience at a host site, including a special project and final report.
- **Structure**: 6-month site-based internship; scheduled teleconferences, ongoing electronic discussions and/or online assignments will supplement experience. Certificate awarded upon completion.
- **Estimated cost**: $2,000 program fee; this does not include travel or living expenses at the internship site.

1. Would you consider applying to this program now ***or in the future***?
   - ❑ Yes (*answer questions below*) **22 (22.9%)**
   - ❑ Probably not, because: **74 (77.1%)**

2. A number of factors might influence your decision to apply to this program. *We are interested in how important each of these factors would be on your decision to apply to this program.*

| | | Very Important | Important | Less important | Not applicable | Missing[1] |
|---|---|---|---|---|---|---|
| A | Ability to maintain employment | 18 (18.8%) | 3 (3.1%) | 0 | 1 (1.0%) | 74 (77.1%) |
| B | Availability of dependent family care assistance | 3 (3.1%) | 2 (2.1%) | 9 (9.4%) | 7 (7.3%) | 75 (78.1%) |
| C | Academic reputation of UNC-CH | 9 (9.4%) | 10 (10.4%) | (1.0%) | 1 (1.0%) | 75 (78.1%) |
| D | Consistency of content with my career goals (see description above) | 18 (18.8%) | 3 (3.1%) | 1 (1.0%) | 0 | 74 (77.1%) |
| E | Cost of program | 8 (8.3%) | 12 (12.5%) | 2 (2.1%) | 0 | 74 (77.1%) |
| F | Formal recognition/certification of completion | 9 (9.4%) | 10 (10.4%) | 3 (3.1%) | 0 | 74 (77.1%) |
| G | Geographic proximity to home | 9 (9.4%) | 9 (9.4%) | 3 (3.1%) | 0 | 75 (78.1%) |
| H | Length of program | 10 (10.4%) | 10 (10.4%) | 2 (2.1%) | 0 | 74 (77.1%) |
| I | Library and computer lab resources | 11 (11.5%) | 9 (9.4%) | 2 (2.1%) | 0 | 74 (77.1%) |
| J | Opportunities for personal interaction with working professionals and being mentored | 13 (13.5%) | 8 (8.3%) | 1 (1.0%) | 0 | 74 (77.1%) |
| K | Opportunities for professional involvement such as conferences and participation in research projects | 11 (11.5%) | 7 (7.3%) | 4 (4.2%) | 0 | 74 (77.1%) |
| L | Recommendation from a colleague, alumni, current student, or relative | 3 (3.1%) | 10 (10.4%) | 8 (8.3%) | 0 | 75 (78.1%) |
| M | Reputation of host site within the profession | 8 (8.3%) | 11 (11.5%) | 3 (3.1%) | 0 | 74 (77.1%) |
| N | Other (*Please specify*): | | | | | |

[1] Respondents were instructed to skip questions 2-8 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

Which of the above factors are **MOST IMPORTANT** to you?

| | |
|---|---|
| **A** | **16** |
| B | 0 |
| C | 4 |
| **D** | **8** |
| **E** | **5** |
| F | 3 |
| **G** | **8** |
| **H** | **6** |
| I | 1 |
| **J** | **6** |
| **K** | **4** |
| L | 0 |
| M | 3 |
| N | 0 |

3. Would this program be more attractive to you if it included required academic coursework?

| | |
|---|---|
| ❑ Yes | **7 (7.3%)** |
| ❑ No | **12 (12.5%)** |
| ***Missing*** | **77 (80.2%)**[2] |

4. Given your interest in the program and the estimated cost described above, what is the maximum you might contribute to your own support? $_____

5. Do you think your employer would be willing to contribute support for your participation in this program?

| | |
|---|---|
| ❑ Yes | **12 (12.5%)** |
| ❑ No | **9 (9.4%)** |
| ***Missing*** | **75 (78.1%)** |

If yes, what kinds of support do you think your employer might provide?

| | |
|---|---|
| ❑ Paid time off | **0**[3]**=14(14.6%); 1=6(6.3%); *Missing*=76(79.2%)** |
| ❑ Time off with partial pay | **0=16(16.7%); 1=4(4.2%); *Missing*=76(79.2%)** |
| ❑ Unpaid time off | **0=15(15.6%); 1=5(5.2%); *Missing*=76(79.2%)** |
| ❑ Full tuition for the program | **0=17(17.7%); 1=3(3.1%); *Missing*=76(79.2%)** |
| ❑ Partial tuition for the program | **0=13(13.5%); 1=7(7.3%); *Missing*=76(79.2%)** |
| ❑ Travel support | **0=17(17.7%); 1=3(3.1%); *Missing*=76(79.2%)** |
| ❑ Other; please specify: | **0=19(19.8%); 1=1(1.0%); *Missing*=76(79.2%)** |

6. How far would you be willing to commute to a host site?

| | | | |
|---|---|---|---|
| ❑ 10 or fewer miles | **2(2.1%)** | ❑ 151-200 miles | **0** |
| ❑ 11-30 miles | **5(5.2%)** | ❑ 201-300 miles | **1(1.0%)** |
| ❑ 31-50 miles | **7(7.3%)** | ❑ 300-500 miles | **0** |
| ❑ 51-100 miles | **4(4.2%)** | ❑ More than 500 miles | **1(1.0%)** |
| ❑ 101-150 miles | **2(2.1%)** | ***Missing*** | **74(77.1%)** |

[2] Respondents were instructed to skip questions 2-8 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.
[3] Selection of this option was coded "1." Non-selection was coded "0."

7. Would you be willing to relocate to a host site?

| | |
|---|---|
| ❑ Yes | **5(5.2%)** |
| ❑ No | **17(17.7%)** |
| ***Missing*** | **74(77.1%)**[4] |

8. In planning this program, is there anything else you can suggest we might want to consider?

[4] Respondents were instructed to skip questions 2-8 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

## Program 2:
### *Certificate of Advanced Study (CAS)*

An on-campus, post-master's program designed for both new and experienced practitioners who seek an articulated and systematic continuing education program to redirect their career paths or to update their skills.

- **Content emphasizes**: design and evaluation of information services; creation, management and use of health information systems; health care environment; and advanced systems design and networking. Includes a major site-related project in a health sciences information setting.
- **Structure**: 30 credits (3 semesters full-time); primarily on-campus courses, supplemented with electronic/Web-supported materials.
- **Estimated annual cost**: tuition and fees for full-time student: $2,200 for North Carolina resident and $10,700 for out-of-state resident; this does not include books and materials or living expenses.

1. Would you consider applying to this program now ***or in the future***?

| | |
|---|---|
| ❑ Yes (*answer questions below*) | **9(9.4%)** |
| ❑ Probably not, because: | **86(89.6%)** (*If probably not, skip to Program 3.*) |
| ***Missing*** | **1(1.0%)** |

2. A number of factors might influence your decision to apply to this program. *We are interested in how important each of these factors would be on your decision to apply to this program.*

| | | Very Important | Important | Less important | Not applicable | Missing[5] |
|---|---|---|---|---|---|---|
| A | Ability to maintain employment | 5(5.2%) | 2(2.1%) | 0 | 0 | 89(92.7%) |
| B | Academic reputation of UNC-CH | 2(2.1%) | 1(1.0%) | 4(4.2%) | 0 | 89(92.7%) |
| C | Availability of dependent family care assistance | 2(2.1%) | 0 | 2(2.1%) | 4(4.2%) | 88(91.7%) |
| D | Consistency of content with my career goals (see description above) | 5(5.2%) | 3(3.1%) | 0 | 0 | 88(91.7%) |
| E | Cost of program | 3(3.1%) | 4(4.2%) | 1(1.0%) | 0 | 88(91.7%) |
| F | Diversity/composition of student body | 0 | 3(3.1%) | 4(4.2%) | 0 | 89(92.7%) |
| G | Flexible schedule and class structure | 3(3.1%) | 3(3.1%) | 2(2.1%) | 0 | 88(91.7%) |
| H | Formal recognition/certification of completion | 4(4.2%) | 4(4.2%) | 1(1.0%) | 0 | 88(91.7%) |
| I | Geographic proximity to home | 4(4.2%) | 3(3.1%) | 1(1.0%) | 0 | 88(91.7%) |
| J | Length of program | 1(1.0%) | 6(6.3%) | 1(1.0%) | 0 | 88(91.7%) |
| K | Library and computer lab resources | 5(5.2%) | 3(3.1%) | 0 | 0 | 88(91.7%) |
| L | Opportunities for personal interaction among students | 1(1.0%) | 2(2.1%) | 5(5.2%) | 0 | 88(91.7%) |
| M | Opportunities for personal interaction with working professionals and being mentored | 4(4.2%) | 3(3.1%) | 1(1.0%) | 0 | 88(91.7%) |
| N | Opportunities for professional involvement such as conferences and participation in research projects | 5(5.2%) | 3(3.1%) | 0 | 0 | 88(91.7%) |
| O | Recommendation from a colleague, alumni, current student, or relative | 3(3.1%) | 1(1.0%) | 4(4.2%) | 0 | 88(91.7%) |
| P | Research reputation of faculty | 3(3.1%) | 3(3.1%) | 2(2.1%) | 0 | 88(91.7%) |
| Q | Size of classes | 1(1.0%) | 3(3.1%) | 4(4.2%) | 0 | 88(91.7%) |
| R | Teaching reputation of faculty | 3(3.1%) | 3(3.1%) | 2(2.1%) | 0 | 88(91.7%) |
| S | Other (*Please specify*): | | | | | |

[5] Respondents were instructed to skip questions 2 – 5 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

Which of these factors are **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

| | |
|---|---|
| A | 5 |
| B | 1 |
| C | 0 |
| D | 3 |
| E | 1 |
| F | 0 |
| G | 1 |
| H | 1 |
| I | 0 |
| J | 1 |
| K | 1 |
| L | 0 |
| M | 2 |
| N | 2 |
| O | 0 |
| P | 0 |
| Q | 0 |
| R | 1 |

3. Given your interest in the program and the estimated cost described above, what is the maximum you might contribute to your own support? $_____

4. Do you think your employer would be willing to contribute support for your participation in this program?

| | |
|---|---|
| ❑ Yes | **3(3.1%)** |
| ❑ No | **5(5.2%)** |
| ***Missing*** | **88(91.7%)**[6] |

If yes, what kinds of support do you think your employer might provide?

| | |
|---|---|
| ❑ Paid time off | **0=4(4.2%); 1=2(2.1%); *Missing*=90(93.8%)** |
| ❑ Time off with partial pay | **0=5(5.2%); 1=1(1.0%); *Missing*=90(93.8%)** |
| ❑ Unpaid time off | **0=6(6.3%); 1=0(0.0%); *Missing*=90(93.8%)** |
| ❑ Full tuition for the program | **0=5(5.2%); 1=1(1.0%); *Missing*=90(93.8%)** |
| ❑ Partial tuition for the program | **0=3(3.1%); 1=3(3.1%); *Missing*=90(93.8%)** |
| ❑ Travel support | **0=5(5.2%); 1=1(1.0%); *Missing*=90(93.8%)** |
| ❑ Other; please specify: | **0=6(6.3%); 1=0(0.0%); *Missing*=90(93.8%)** |

5. In planning this program, is there anything else you can suggest we might want to consider?

[6] Respondents were instructed to skip questions 2 – 5 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

## Program 3:
## *Executive Certificate of Advanced Study (ECAS)*

A post-master's program designed for currently employed information professionals, combining short on-campus sessions followed by independent study at the student's work site. Focuses on executive-level preparation. Provides opportunities to enrich and strengthen existing capabilities, develop subject or functional specialty, or to redirect a career.

- **Content emphasizes:** advanced management skills; advanced communications and presentation skills; health care environment; design and evaluation of information services; and creation, management and use of health information systems. Includes a major site-related project.
- **Structure:** 30 credits (two years part-time); on-campus time scheduled in periodic weekend seminars and summer institutes; scheduled teleconferences, ongoing electronic discussions and online assignments will supplement learning on campus. Program assumes participants will continue current employment.
- **Estimated total cost:** tuition and fees $4,500 for North Carolina resident, $10,500 for out-of-state resident; this does not include travel and living expenses for about 16 days, during five trips to campus.

1. Would you consider applying to this program now ***or in the future***?

| | |
|---|---|
| ❑ Yes (*answer questions below*) | **23(24.0%)** |
| ❑ Probably not, because: | **72(75.0%)** (*If probably not, skip to Program 4.*) |
| ***Missing*** | **1(1.0%)** |

2. A number of factors might influence your decision to apply to this program. *We are interested in how important each of these factors would be on your decision to apply to this program.*

| | | Very Important | Important | Less important | Not applicable | *Missing*[7] |
|---|---|---|---|---|---|---|
| A | Ability to maintain employment | 21(21.9%) | 1(1.0%) | 1(1.0%) | 0 | 73(76.0%) |
| B | Academic reputation of UNC-CH | 10(10.4%) | 10(10.4%) | 3(3.1%) | 0 | 73(76.0%) |
| C | Availability of dependent family care assistance | 5(5.2%) | 2(2.1%) | 11(11.5%) | 4(4.2%) | 74(77.1%) |
| D | Consistency of content with my career goals (see description above) | 20(20.8%) | 3(3.1%) | 0 | 0 | 73(76.0%) |
| E | Cost of program | 14(14.6%) | 8(8.3%) | 1(1.0%) | 0 | 73(76.0%) |
| F | Diversity/composition of student body | 2(2.1%) | 6(6.3%) | 13(13.5%) | 1(1.0%) | 74(77.1%) |
| G | Flexible schedule and class structure | 18(18.8%) | 5(5.2%) | 0 | 0 | 73(76.0%) |
| H | Formal recognition/certification of completion | 15(15.6%) | 6(6.3%) | 2(2.1%) | 0 | 73(76.0%) |
| I | Geographic proximity to home | 13(13.5%) | 5(5.2%) | 4(4.2%) | 0 | 74(77.1%) |
| J | Length of program | 14(14.6%) | 9(9.4%) | 0 | 0 | 73(76.0%) |
| K | Library and computer lab resources | 9(9.4%) | 13(13.5%) | 1(1.0%) | 0 | 73(76.0%) |
| L | Opportunities for personal interaction among students | 4(4.2%) | 12(12.5%) | 7(7.3%) | 0 | 73(76.0%) |
| M | Opportunities for personal interaction with working professionals and being mentored | 9(9.4%) | 11(11.5%) | 3(3.1%) | 0 | 73(76.0%) |
| N | Opportunities for professional involvement such as conferences and participation in research projects | 10(10.4%) | 12(12.5%) | 1(1.0%) | 0 | 73(76.0%) |
| O | Recommendation from a colleague, alumni, current student, or relative | 4(4.2%) | 9(9.4%) | 10(10.4%) | 0 | 73(76.0%) |
| P | Research reputation of faculty | 5(5.2%) | 17(17.7%) | 1(1.0%) | 0 | 73(76.0%) |
| Q | Size of classes | 6(6.3%) | 10(10.4%) | 7(7.3%) | 0 | 73(76.0%) |
| R | Teaching reputation of faculty | 12(12.5%) | 9(9.4%) | 2(2.1%) | 0 | 73(76.0%) |
| S | Other (*Please specify*): | | | | | |

[7] Respondents were instructed to skip questions 2 – 7 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.


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Which of these factors are **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

| | |
|---|---|
| A | 13 |
| B | 0 |
| C | 1 |
| D | 8 |
| E | 5 |
| F | 0 |
| G | 9 |
| H | 4 |
| I | 3 |
| J | 0 |
| K | 2 |
| L | 0 |
| M | 2 |
| N | 1 |
| O | 0 |
| P | 0 |
| Q | 0 |
| R | 0 |

3. Given your interest in the program and the estimated cost described above, what is the maximum you might contribute to your own support? $_____

4. Do you think your employer would be willing to contribute support for your participation in this program?

| | |
|---|---|
| ❑ Yes | **16(16.7%)** |
| ❑ No | **5(5.2%)** |
| ***Missing*** | **75(78.1%)**[8] |

If yes, what kinds of support do you think your employer might provide?

| | |
|---|---|
| ❑ Paid time off | **0=18(18.8%); 1=4(4.2%); *Missing*=74(77.1%)** |
| ❑ Time off with partial pay | **0=21(21.9%); 1=1(1.0%); *Missing*=74(77.1%)** |
| ❑ Unpaid time off | **0=14(14.6%); 1=8(8.3%); *Missing*=74(77.1%)** |
| ❑ Full tuition for the program | **0=20(20.8%); 1=2(2.1%); *Missing*=74(77.1%)** |
| ❑ Partial tuition for the program | **0=10(10.4%); 1=12(12.5%); *Missing*=74(77.1%)** |
| ❑ Travel support | **0=19(19.8%); 1=3(3.1%); *Missing*=74(77.1%)** |
| ❑ Other; please specify: | **0=21(21.9%); 1=0(0.0%); *Missing*=75(78.1%)** |

[8] Respondents were instructed to skip questions 2 – 7 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

5. How far would you be willing to travel to class sites? *Consider that there are five trips to campus during the proposed program.*

| | | | |
|---|---|---|---|
| ❑ 10 or fewer miles | 1(1.0%) | ❑ 151-200 miles | 2(2.1%) |
| ❑ 11-30 miles | 4(4.2%) | ❑ 201-300 miles | 0(0.0%) |
| ❑ 31-50 miles | 4(4.2%) | ❑ 300-500 miles | 4(4.2%) |
| ❑ 51-100 miles | 4(4.2%) | ❑ More than 500 miles | 2(2.1%) |
| ❑ 101-150 miles | 2(2.1%) | | |

6. Do you have access to:
   a. videoconferencing?

| | |
|---|---|
| ❑ Yes | **15(15.6%)** |
| ❑ No | **6(6.3%)** |
| ❑ Don't know | **2(2.1%)** |
| ***Missing*** | **73(76.0%)**[9] |

   b. the World Wide Web?

| | |
|---|---|
| ❑ Yes | **20(20.8%)** |
| ❑ No | **3(3.1%)** |
| ❑ Don't know | **0(0.0%)** |
| ***Missing*** | **73(76.0%)** |

7. In planning this program, is there anything else you can suggest we might want to consider?

[9] Respondents were instructed to skip questions 2 – 7 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

## Program 4:
## *Ph.D. with Health Sciences Specialization*

The purpose of this doctoral program is to educate scholars who are capable of addressing problems of scholarly consequence in the fields of information and library science and, specifically, related to health sciences information management.

- **Content emphasizes**: research skills; design and evaluation of information services and programs; medical informatics; and creation, management, and use of health information systems. Includes a research practicum.
- **Structure:** minimum of 36 credits (2 years full-time) plus the dissertation; primarily on-campus courses in the School of Information and Library Science and other departments.
- **Estimated annual cost:** tuition and fees for full-time student: $2,200 for North Carolina resident, $10,700 for out-of-state resident; this does not include books and materials or living expenses.

1. Would you consider applying to this program?

| | |
|---|---|
| ❑ Yes (*answer questions below*) | **10(10.4%)** |
| ❑ Probably not, because: | **84(87.5%)** (*skip to demographic questions on page 10*) |
| ***Missing*** | **2(2.1%)** |

2. A number of factors might influence your decision to apply to this program. *We are interested in how important each of these factors would be on your decision to apply to this program.*

| | | Very Important | Important | Less important | Not applicable | *Missing*[10] |
|---|---|---|---|---|---|---|
| A | Ability to maintain employment | 7(7.3%) | 3(3.1%) | 0 | 0 | 86(89.6%) |
| B | Academic reputation of UNC-CH | 6(6.3%) | 2(2.1%) | 1(1.0%) | 0 | 87(90.6%) |
| C | Availability of dependent family care assistance | 2(2.1%) | 0 | 6(6.3%) | 1(1.0%) | 87(90.6%) |
| D | Consistency of content with my career goals (see description above) | 9(9.4%) | 0 | 1(1.0%) | 0 | 86(89.6%) |
| E | Cost of program | 6(6.3%) | 4(4.2%) | 0 | 0 | 86(89.6%) |
| F | Diversity/composition of student body | 1(1.0%) | 4(4.2%) | 5(5.2%) | 0 | 86(89.6%) |
| G | Flexible schedule and class structure | 6(6.3%) | 3(3.1%) | 1(1.0%) | 0 | 86(89.6%) |
| H | Geographic proximity to home | 6(6.3%) | 4(4.2%) | 0 | 0 | 86(89.6%) |
| I | Length of program | 5(5.2%) | 5(5.2%) | 0 | 0 | 86(89.6%) |
| J | Library and computer lab resources | 4(4.2%) | 4(4.2%) | 1(1.0%) | 0 | 87(90.6%) |
| K | Opportunities for personal interaction among students | 3(3.1%) | 2(2.1%) | 4(4.2%) | 0 | 87(90.6%) |
| L | Opportunities for personal interaction with working professionals and being mentored | 5(5.2%) | 2(2.1%) | 3(3.1%) | 0 | 86(89.6%) |
| M | Opportunities for professional involvement such as conferences and participation in research projects | 4(4.2%) | 5(5.2%) | 1(1.0%) | 0 | 86(89.6%) |
| N | Recommendation from a colleague, alumni, current student, or relative | 2(2.1%) | 3(3.1%) | 4(4.1%) | 1(1.0%) | 86(89.6%) |
| O | Research reputation of faculty | 5(5.2%) | 3(3.1%) | 1(1.0%) | 1(1.0%) | 86(89.6%) |
| P | Size of classes | 3(3.1%) | 3(3.1%) | 3(3.1%) | 1(1.0%) | 86(89.6%) |
| Q | Teaching reputation of faculty | 6(6.3%) | 2(2.1%) | 1(1.0%) | 1(1.0%) | 86(89.6%) |
| R | Other (*Please specify*): | | | | | |

[10] Respondents were instructed to skip questions 2 – 5 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

Which of these factors are **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

| | |
|---|---|
| **A** | **6** |
| B | 2 |
| C | 0 |
| **D** | **5** |
| E | 4 |
| F | 0 |
| **G** | **5** |
| H | 3 |
| I | 0 |
| J | 1 |
| K | 0 |
| L | 1 |
| M | 1 |
| N | 1 |
| O | 1 |
| P | 0 |
| Q | 0 |

3. Given your interest in the program and the estimated cost described above, what is the maximum you might contribute to your own support? $_____

4. Do you think your employer would be willing to contribute support for your participation in this program?

| | |
|---|---|
| ❑ Yes | **7(7.3%)** |
| ❑ No | **3(3.1%)** |
| ***Missing*** | **86(89.6%)**[11] |

If yes, what kinds of support do you think your employer might provide?

| | |
|---|---|
| ❑ Paid time off | **0=6(6.3%); 1=3(3.1%); *Missing*=87(90.6%)** |
| ❑ Time off with partial pay | **0=8(8.3%); 1=1(1.0%); *Missing*=87(90.6%)** |
| ❑ Unpaid time off | **0=7(7.3%); 1=2(2.1%); *Missing*=87(90.6%)** |
| ❑ Full tuition for the program | **0=8(8.3%); 1=1(1.0%); *Missing*=87(90.6%)** |
| ❑ Partial tuition for the program | **0=4(4.2%); 1=5(5.2%); *Missing*=87(90.6%)** |
| ❑ Travel support | **0=6(6.3%); 1=3(3.1%); *Missing*=87(90.6%)** |
| ❑ Other; please specify: | **0=7(7.3%); 1=2(2.1%); *Missing*=87(90.6%)** |

5. In planning this program, is there anything else you can suggest we might want to consider?

[11] Respondents were instructed to skip questions 2 – 5 if they responded "Probably not" to question 1. This accounts for the frequency of "missing" responses.

***Demographic questions***

1. Of which professional associations are you a member?

| | |
|---|---|
| ❑ Medical Library Association | **0=58(60.4%); 1=36(37.5%); *Missing*=2(2.1%)** |
| ❑ American Health Information Management Association | **0=79(82.3%); 1=15(15.6%); *Missing*=2(2.1%)** |
| ❑ American Library Association | **0=58(60.4%); 1=36(37.5%);*Missing*=2(2.1%)** |
| ❑ American Medical Informatics Association | **0=91(94.8%); 1=3(3.1%); *Missing*=2(2.1%)** |
| ❑ American Society for Information Science | **0=86(89.6%); 1=8(8.3%); *Missing*=2(2.1%)** |
| ❑ Association of Academic Health Sciences Library Directors | **0=93(96.9%); 1=1(1.0%); *Missing*=2(2.1%)** |
| ❑ Special Libraries Association | **0=76(79.2%); 1=18(18.8%); *Missing*=2(2.1%)** |
| ❑ Other: | **0=67(69.8%); 1=27(28.1%); *Missing*=2(2.1%)** |

2. How many years of professional library or information management experience do you have?

| | | | |
|---|---|---|---|
| ❑ Less than 2 years | **2(2.1%)** | ❑ 11-15 years | **25(26.0%)** |
| ❑ 2-5 years | **11(11.5%)** | ❑ 16-20 years | **18(18.8%)** |
| ❑ 6-10 years | **18(18.8%)** | ❑ 21-25 years | **14(14.6%)** |
| | | ❑ More than 25 years | **6(6.3%)** |
| | | ***Missing*** | **2(2.1%)** |

3. What is your gender?

| | |
|---|---|
| ❑ Female | **83(86.5%)** |
| ❑ Male | **10(10.4%)** |
| ***Missing*** | **3(3.1%)** |

4. What is your age?

| | | | |
|---|---|---|---|
| ❑ 20-25 | **1(1.0%)** | ❑ 41-45 | **15(15.6%)** |
| ❑ 26-30 | **4(4.2%)** | ❑ 46-50 | **25(26.0%)** |
| ❑ 31-35 | **8(8.3%)** | ❑ 51-55 | **13(13.5%)** |
| ❑ 36-40 | **19(19.8%)** | ❑ 56-60 | **6(6.3%)** |
| | | ❑ 61 or greater | **1(1.0%)** |
| | | ***Missing*** | **4(4.2%)** |

5. What academic degrees have you ***already*** completed and when? **Year Completed** **Subject Area**

| | |
|---|---|
| ❑ BA/BS | **0=1(1.0%); 1=91(94.8%); *Missing*=4(4.2%)** |
| ❑ MLS/MIS | **0=26(27.1%); 1=68(70.8%); *Missing*=2(2.1%)** |
| ❑ Other master's | **0=72(75.0%); 1=21(21.9%); *Missing*=3(3.1%)** |
| ❑ Ph.D. | **0=91(94.8%); 1=3(3.1%); *Missing*=2(2.1%)** |
| ❑ Other: | |

6. By what category of institution are you currently employed?

*A. Library:*

- ❑ Hospital library **15(15.6%)**
- ❑ Academic health sciences library **14(14.6%)**
- ❑ Other academic library **12(12.5%)**
- ❑ Corporate library **4(4.2%)**
- ❑ Library in a government agency, including Veterans Administration hospital **3(3.1%)**

*B. Non-library setting:*

- ❑ Academic health sciences center **0(0.0%)**
- ❑ Other hospital **10(10.4%)**
- ❑ Government agency, including Veterans Administration hospital **4(4.2%)**

❑ Other (please specify): **31(32.3%)**

***Missing*** **3(3.1%)**

7. What is your current position?

---

How long have you held this position?

| | | | |
|---|---|---|---|
| ❑ Less than 2 years | **16(16.7%)** | ❑ 11-15 years | **11(11.5%)** |
| ❑ 2-5 years | **31(32.3%)** | ❑ More than 15 years | **10(10.4%)** |
| ❑ 6-10 years | **25(26.0%)** | ***Missing*** | **3(3.1%)** |

8. What is your current salary?

| | | | |
|---|---|---|---|
| ❑ Less than $20,000 | **2(2.1%)** | ❑ $50,001-$60,000 | **16(16.7%)** |
| ❑ $20,001-$30,000 | **10(10.4%)** | ❑ $60,001-$70,000 | **10(10.4%)** |
| ❑ $30,001-$40,000 | **26(27.1%)** | ❑ $70,001-$80,000 | **2(2.1%)** |
| ❑ $40,001-$50,000 | **20(20.8%)** | ❑ Greater than $80,000 | **2(2.1%)** |
| | | ***Missing*** | **8(8.3%)** |

Mid-career respondents were asked to indicate the maximum amount they would be willing to contribute to their own support for each program in which they were interested. Results for each of the four programs targeted to mid-career participants are summarized below.

**AIP**

- Cost: $2,000 plus travel and living expenses for six months.
- Fourteen of the 22 respondents who expressed an interest in the AIP provided information about the amount they would be willing to contribute. One respondent indicated a willingness to contribute the "full amount" of the costs. Two other respondents indicated a willingness to contribute $3,000 and $4,000. The most frequently selected amount was $1,000 (eight respondents). Other respondents indicated a willingness to contribute $2,000, $1,500 and $500.

**CAS**

- Cost: Tuition and fees would cost $2,200 annually for North Carolina residents and $10,700 annually for out-of-state participants. Books, materials and living expenses for three semesters are additional expenses.
- Five of the nine respondents who expressed an interest in the CAS program provided information about the amount they would be willing to contribute. One respondent indicated a willingness to contribute $9,000. Two would contribute $5,000 and two would contribute $2,000.

**ECAS**

- Cost: Annual cost for the two-year program would be $4,500 for North Carolina residents and $10,500 for out-of-state participants. In addition, there are the costs of travel and living expenses for about 16 days during five trips to campus.
- Eighteen of the 23 respondents who expressed an interest in the ECAS program provided information about the amount they would be willing to contribute. One respondent indicated a willingness to contribute the "full amount." Another respondent indicated a willingness to contribute $10,500. Six respondents indicated that the maximum they would be willing to contribute would be between $4,000 and $6,000. Eight respondents indicated a willingness to contribute amounts between $1,500 and $2,500. One respondent indicated a willingness to contribute $500, and another indicated that they would not be willing to contribute anything for participating in the program.

**PhD with Health Sciences Specialization**

- Cost: Annual cost for tuition and fees for North Carolina residents would be $2,200, and $10,700 for out-of-state participants. Additional costs would include books, materials and living expenses.
- Six of the ten respondents who expressed an interest in the PhD with health sciences specialization program provided information about the amount they would be willing to contribute. One respondent indicated a willingness to contribute $20,000. Another indicated a willingness to contribute $6,000. Three indicated they would be willing to contribute $2,000, and one respondent indicated that she had "no idea" how much she would be willing to contribute.

## Inferential Statistical Analyses

Among the mid-career data is a *p*-value of .053 for the chi-square analysis of sample membership and interest in applying to the ECAS. This finding should be interpreted with caution, however, as three cells have counts of less than five. This finding can be understood as only suggesting that more of the AHIMA members are interested in the ECAS than would be expected by chance; fewer of the ALA members would be interested in the ECAS than expected by chance; and more of the MLA members would be interested in the ECAS than would be expected by chance.

TABLE OF SAMPLE BY INTEREST IN APPLYING TO THE ECAS PROGRAM

| SAMPLE / ECASAPPLY<br>Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| AHIMA | 11 | 6 | 17 |
| | 12.884 | 4.1158 | |
| | 0.2756 | 0.8626 | |
| | 11.58 | 6.32 | 17.89 |
| | 64.71 | 35.29 | |
| | 15.28 | 26.09 | |
| ALA | 25 | 2 | 27 |
| | 20.463 | 6.5368 | |
| | 1.0059 | 3.1488 | |
| | 26.32 | 2.11 | 28.42 |
| | 92.59 | 7.41 | |
| | 34.72 | 8.70 | |
| ASIS | 5 | 3 | 8 |
| | 6.0632 | 1.9368 | |
| | 0.1864 | 0.5836 | |
| | 5.26 | 3.16 | 8.42 |
| | 62.50 | 37.50 | |
| | 6.94 | 13.04 | |
| MLA | 25 | 12 | 37 |
| | 28.042 | 8.9579 | |
| | 0.33 | 1.0331 | |
| | 26.32 | 12.63 | 38.95 |
| | 67.57 | 32.43 | |
| | 34.72 | 52.17 | |
| SLA | 6 | 0 | 6 |
| | 4.5474 | 1.4526 | |
| | 0.464 | 1.4526 | |
| | 6.32 | 0.00 | 6.32 |
| | 100.00 | 0.00 | |
| | 8.33 | 0.00 | |
| Total | 72 | 23 | 95 |
| | 75.79 | 24.21 | 100.00 |

Frequency Missing = 1

STATISTICS FOR TABLE OF SAMPLE BY ECASAPPLY

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 4 | 9.343 | 0.053 |
| Likelihood Ratio Chi-Square | 4 | 11.619 | 0.020 |
| Mantel-Haenszel Chi-Square | 1 | 0.029 | 0.866 |
| Phi Coefficient | | 0.314 | |
| Contingency Coefficient | | 0.299 | |
| Cramer's V | | 0.314 | |

Effective Sample Size = 95
Frequency Missing = 1
WARNING: 40% of the cells have expected counts less
than 5. Chi-Square may not be a valid test.

**Mid-Careers' Reasons for No Interest (Question 1)**

*AIP*

I supervise library school interns myself

Cost of program does not translate into growth in income potential

Family--couldn't leave that long

Cost

I have a young child & would not want to be away from home for long periods of time in the foreseeable future

Expensive and I have a doctorate

Location

I want more than a certificate.

My job duties are already higher than the program content.

Would not want to relocate; could not get time away from current job.

I will retire in 7 years.

Do not anticipate career changes at present.

I would be interested in a PhD

Cost; disruption of career

Can get these experiences elsewhere

Too long

Close to retirement

Program not generally recognized as having value that would result in promotion or future employment. Also, too far along in my career to justify the time and effort.

My experience in management; My age; I am retired because of disability

I don't see any description of the actual program/course content.

Time, money and effort invested may not comparably benefit my career.

Unable to leave work for 6 months

I am already at the top of the academic structure at my institution.

It doesn't seem like much for the money.

Distance from family

No interest

I am firmly established in another branch of the profession.

(1) Geographic location. (2) My current situation is stable and improving.

Prefere children's services work.

Of young children and husband's work schedule.

Not needed and N/A

I am not interested in this specialization.

I am a public library director.

I am not interested in another degree or certification.

Not interested in medical librarianship.

Health info is not my area of interest

Not my area of interest

Not interested in health sci.

Not interested in health specialty

Not interested in health info mgt at this time.

My interests are centered in the public library area.

My interest is not health science

Not interested in the health care field

I love being in schools

Near retirement/No background in health sciences

I already feel I receive exposure and maintain knowledge on innovative and technological practices.

Could not maintain employment

Six months away from job

I work full-time - 6 months too long to be gone

I don't have a master's degree currently and don't intend to pursue one anytime in the near future.

No interest

I am approaching retirement; not interested in doing anythign more in the way of a career - also, my training/interest is in medical record administration, not library science or information management.

Need to maintain full-time job - would not allow 6 months out of work unless educational leave taken. No mention made of intent for marketing value of certificate in AIP -- what jobs will it entitle you to apply for that are not currently listed for ... - Is it Human Resource recognized?

Due to time constraints and current employment out of state

It doesn't apply to my personal career goals.

Health information is not my chosen field

Effort on present work position in federal govt.

I don't do well in internship-type learning settings.

Interested in program 3

Currently in a graduate program

6 months site-based. Can't do that and work too.

Not interested

No longer in health sciences

Not able to relocate

I'm very happy in my current position.

I need income from working: could not intern

***CAS***

The investments of on-campus time and money are too high for this type of program (non-degree)

Too far away. We have 2 lib schools in Wisconsin

Cost--Location from home

Cost and time

2 kids in college

Cost and family

Cost

Costs are so much more for out-of-state residents

Time away from family; cost; possibility of other advanced study programs closer to home

I already have a doctorate. I can't leave my job for 3 semesters

Location; cost

Cost

I live out of state.

Unwilling to relocate to NC

I will retire in 7 years.

Do not anticipate career change at present.

Cost and time

Can't afford

Cost and disruption of career and location.

Too long; too expensive

Cost and location

Close to retirement

Same reasons as Program #1; I'm too far along in my career to need technical training -- advanced management training would be more relevant.

I am retired for disability

Again, I would like to see proposed/actual content.

Cost prohibitive; would have no income for the year.

Same as one plus I would receive no extra monetary reward for this effort.

Of the cost

No interest

I am not interested in health information systems.

(1) Geographic location. (2) My current situation is stable and improving.

See program 1.

young children and husband's work schedule.

Not needed and N/A

Cost and full time attendance requirement.

Not applicable to school librarian at MS level.

Out of state tuition; too much time.

Not interested in health-care field.

Can do/plan/organize this on my own through wider options.

Not interested in medical librarianship.

Length/Depth of program

Not my area of interest

Not interested in health sci.

I couldn't afford it - I have 2 children headed to college in a few years.

Not interested in health specialty

My interests are centered in the public library area.

My interest is not health science

Not interested in the health care field

Could not enroll in full-time program and maintain current employment.

I love working with faculty and students.

Too expensive, but a good program.

Near retirement/No background in health sciences

Cost - would rather receive another degree.

Could not maintain employment

On-site

Same as #1

This is just not realistic for me.

Same as #1

No interest

Distance to campus

See previous answer

Certificate programs available locally on health informatics that are cheaper! As a subset of a Master's.

Due to time constraints and current employment out of state

Cost

I am not interested in pursuing a career in info mgmt, but rather in hospital admin in general

Health information is not my chosen field

Not interested in on-campus study

Would not relocate to North Carolina

Interested in program 3

Currently in a graduate program

Cost and distance

On campus requirement

Not interested

Not in health sci.

Not able to relocate

Expense, and not enough practical work experience in program

I'm very happy with my current job.

I need income from working full-time

*ECAS*

Would not go to NC. Have lib schools with post-masters in Wisconsin

Cost--location from home

Costs so much higher for out-of-state resident

Time away from home; cost; possiblity of advanced study closer to home

I have a doctorate. I'm finished with formal schooling although I keep up with CE courses.

The cost of both time and money would not e recouped in my salary.

I live out of state.

Expense of travel for 5 trips to NC

I will retire in 7 years.

Do not anticipate career change at present.

Can't afford nor move

Cost; location; disruption of career.

Not interested in management presently

Tuition too high; travel costs

Cost and location

Close to retirement

I am retired with disability

Sounds fluffy.

Too expensive; may not comparably benefit my career.

Cost and need to provide travel and living expenses

Same as previous

Cost

No interest

I am not interested in health information systems.

(1) Geographic location. (2) My current situation is stable and improving.

See program 1.

Not needed and N/A

Out of state tuition; time away from work.

Same as 2.

Prefer PhD to further advance career.

Not interested in medical librarianship.

Not interested in management.

Not my area of interest

Not interested in health sci.

Cost and I would get no financial help from my employer.

Not interested in health specialty

Not interested at this time.

My interests are centered in the public library area.

My interest is not health science

No interest

Do not feel qualified

Not interested in specializing in the health care sciences.

Too expensive

Near retirement/No background in health sciences

Cost - would rather get another degree.

Same as response to Program #1.

Not specific - have had in MBA

No interest

Distance to campus

See answer to Program 1

Cost

My plans are to get a master's degree in healthcare admin.

Health information is not my chosen field

Not interested in on-campus study

I'd like to say yes, but the cost would be prohibitive

Cost and wouldn't want on campus time in NC since my job/family is in MA.

Currently in a graduate program

Not interested

Not able to relocate

Not interested in executive level position

I'm very hapy with my job and get on the job training

I am not aware of significant employment opportunities calling for this specialty

***PhD***

Cost--location from home

Cost and time

Too much work--not enough income return

Cost

At present a PhD seems irrelevant to my career

I am not interested in pursuing a doctorate

I already have a doctorate from Columbia University

Same as previous program

I live out of state.

Not interested in pursuing a Ph.D.

Not consistent with career goals

I will retire in 7 years.

Enticing; but cannot make career change at present.

No interest

Money; won't move

Cost; location; disruption of career.

Cost

Cost and location

Close to retirement

The PhD is not a recognized requirement in my career path.

I am retired with disability

Would apply because a PhD in HI is marketable

Too narrow a specialization -- concerned about post-degree marketability

Unable to relocate without income, and pay tuition and expenses

Same as previous

Time away from work and money involved

Cost

No interest

I am not interested in health information systems.

(1) Geographic location. (2) My current situation is stable and improving.

See program 1.

Not interested in a Ph.D. program at this time.

I am not in the health sciences field.

Cost and time required

No interest in specialization at this time.

Out of state tuition and time commitment.

Not interested in medical informatics.

Not interested in medical librarianship.

Not interested in pursuing a PhD

Not my area of interest

Not interested in health sci.

Not interested in health specialty

Not interested in PhD

My interests are centered in the public library area.

No background or interest

Could not devote 2 years full time.

Not interested in health care specialization

Near retirement/No background in health sciences

Cost - out of state tuition and relevancy of a PhD in health sciences.

Not willing to commit to this level at this time.

Too far to go for 2 years.

I'm not interested in a doctoral program at this time.

As previously noted.

Interested in computer technology/IS

No interest

See answer to Program 1.

Can't afford 2 years full time not working.

I am not interested

Cost and time involved

My interest is in administration and risk management.

Health information is not my chosen field

North Carolina location is not convenient

I'm not interested in research and pubishing per say [sic] which usually goes along w/ a PhD.

Not interested

Currently in a graduate program

Onsite residency!

Not interested

Not able to relocate

Not contemplating a PhD in any field at this time

I'm happy with my job

Don't aspire to PhD

## Mid-Careers' Other Factors (Question 2)

***AIP***

Application of technology to information service

***CAS***

None

***ECAS***

None

***PhD***

None

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

January 6, 1997

Dear Colleague:

We are conducting a study on the level of demand for possible new educational programs to prepare health sciences librarians. **I am asking your assistance in giving the enclosed survey to a person in your organization to whom you report.** This person will be part of a sample of employers of health sciences librarians, whom we are asking to help us assess the potential employment demand for graduates of these programs and the factors that affect that demand.

The survey, a cover letter, required consent form, and return envelope are enclosed for you to give to this person, who may return the survey directly to me as indicated on the envelope. I ask your help in getting the survey to this person as quickly as possible. It should be returned by January 27 if possible.

I am also enclosing a postcard for you to complete to allow follow up directly with this person. Please indicate his or her name and return it to me. This is only for follow up on surveys not returned; all responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

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January 6, 1997

Dear Colleague:

We are conducting a study on the level of demand for possible new educational programs to prepare health sciences librarians. You have been selected as part of a random sample of employers of health sciences librarians, to help us assess the potential employment demand for graduates of these programs and the factors that affect that demand.

Please return the survey to me, along with the required consent form, in the return envelope which is provided. PLEASE SEND IT BY JANUARY 27, or as soon as possible. You are part of a small sample whose input will help us decide on the possible implementation of the programs.

The code on the questionnaire will allow us to follow up on surveys not returned; responses will be anonymous during the analysis of data.

This survey is part of a study, "Preparing Tomorrow's Health Sciences Librarians," funded by the National Library of Medicine. The School of Information and Library Science is collaborating with the Health Sciences Library and the Program in Medical Informatics to conduct feasibility and marketing studies on possible approaches to improving the relevance of the initial professional preparation of health sciences librarians and to providing for lifelong learning opportunities to allow practicing health sciences librarians and information professionals to respond to their evolving roles in a rapidly changing environment. The project will examine potential enhancements to existing degree and certificate programs, as well as new on- and off-site programs.

Thank you very much for your help. If you have any questions about the study, please feel free to contact me.

Sincerely,

Barbara B. Moran
Dean and Principal Investigator

# Employers Survey Report
5/1/97

**Response Rate:**

| | |
|---|---|
| **98** | Returned and non-blank surveys |
| 2 | Returned with expressed refusal |
| 1 | Participant reported deceased |
| 250 | Surveys sent out |

Hospital employers
46/(177-1 Reported deceased)=26.1%

Academic employers
46/(62)=74.2%

Other employers
6/(11)=54.5%

*Total Response Rate*: 98 Returned, non-blank / (250 Surveys sent out – 1 Reported deceased) = **39.4%**

1. How many professional staff (permanent FTE) do you currently employ in your library or information center?

| | |
|---|---|
| **Mean** | **6.89** |
| **Std Dev** | **7.15** |
| **Median** | **4.0** |
| **Min** | **0.5** |
| **Max** | **40.0** |

2. Do you expect the number of this staff over the next five to ten years to (*please check one choice*):

| | | |
|---|---|---|
| ❑ Increase | **26** | **(26.5%)** |
| ❑ Decrease | **8** | **(8.2%)** |
| ❑ Stay the same | **64** | **(65.3%)** |

3. What proportion of your professional staff have graduate degrees in library or information science?
___%

| | |
|---|---|
| **Mean** | **78.10** |
| **Std Dev** | **29.68** |
| **Median** | **100** |
| **Min** | **0** |
| **Max** | **100** |

4. Do you expect the number of your professional staff who have graduate degrees in library or information science over the next five to ten years to (*please check one choice*):

| | | |
|---|---|---|
| ❑ Increase | **20** | **(20.4%)** |
| ❑ Decrease | **10** | **(10.2%)** |
| ❑ Stay the same | **65** | **(66.3%)** |
| **Missing** | **3** | **(3.1%)** |

5. The following criteria may be considered when hiring professional staff. Although the criteria may vary according to the position, please rank their overall importance to you <u>when you hired</u> your current professional staff.

| | | **Very Important** | **Important** | **Less important** | **Not applicable** | **MISSING** |
|---|---|---|---|---|---|---|
| A | Undergraduate degree in relevant field | 12(12.2%) | 27(27.6%) | 50(51.0%) | 3(3.1%) | 5(5.1%) |
| B | Graduate degree in library or information science | 69(70.4%) | 18(18.4%) | 4(4.1%) | 4(4.1%) | 3(3.1%) |
| C | Graduate degree in library or information science with health sciences specialization | 24(24.5%) | 49(50.0%) | 21(21.4%) | 3(3.1%) | 1(1.0%) |
| D | Other graduate degree | 3(3.1%) | 19(19.4%) | 60(61.2%) | 11(11.2%) | 5(5.1%) |
| E | Post-master's training | 3(3.1%) | 27(27.6%) | 49(50.0%) | 12(12.2%) | 7(7.1%) |
| F | Extensive on-the-job training | 32(32.7%) | 50(51.0%) | 11(11.2%) | 1(1.0%) | 4(4.1%) |
| G | Previous work history emphasizing continual growth and learning in new areas | 56(57.1%) | 34(34.7%) | 6(6.1%) | 1(1.0%) | 1(1.0%) |
| H | Professional activities such as participation in associations, publications | 14(14.3%) | 57(58.2%) | 23(23.5%) | 3(3.1%) | 1(1.0%) |
| I | Personal traits such as flexibility, initiative, willingness to change, communication skills | 87(88.8%) | 6(6.1%) | 2(2.0%) | 2(2.0%) | 1(1.0%) |
| J | Other (*specify*): | 15(15.3%) | 3(3.1%) | 0 | 0 | 80(81.6%) |

Which of the above factors are **MOST IMPORTANT** to you?
*Write the letters corresponding to up to 3 most important factors:* ___ ___ ___

a 6
b **59**
c **23**
d 1
e 2
f **20**
g **51**
h 4
i **75**
j 15

6. Please rank the same criteria as you anticipate their importance in recruiting your new professional staff over the next five to ten years.

| | | Very Important | Important | Less important | Not applicable | MISSING |
|---|---|---|---|---|---|---|
| A | Undergraduate degree in relevant field | 11(11.2%) | 29(29.6%) | 50(51.0%) | 3(3.1%) | 5(5.1%) |
| B | Graduate degree in library or information science | 52(53.1%) | 38(38.8%) | 4(4.1%) | 1(1.0%) | 3(3.1%) |
| C | Graduate degree in library or information science with health sciences specialization | 41(41.8%) | 31(31.6%) | 19(19.4%) | 1(1.0%) | 6(6.1%) |
| D | Other graduate degree | 8(8.2%) | 26(26.5%) | 53(54.1%) | 7(7.1%) | 4(4.1%) |
| E | Post-master's training | 6(6.1%) | 34(34.7%) | 47(48.0%) | 5(5.1%) | 5(5.1%) |
| F | Extensive on-the-job training | 36(36.7%) | 45(45.9%) | 11(11.2%) | 0 | 6(6.1%) |
| G | Previous work history emphasizing continual growth and learning in new areas | 66(67.3%) | 26(26.5%) | 3(3.1%) | 0 | 3(3.1%) |
| H | Professional activities such as participation in associations, publications | 20(20.4%) | 49(50.0%) | 22(22.4%) | 2(2.0%) | 5(5.1%) |
| I | Personal traits such as flexibility, initiative, willingness to change, communication skills | 88(89.8%) | 5(5.1%) | 2(2.0%) | 0 | 3(3.1%) |
| J | Other (*specify*): | 21(21.4%) | 0 | 1(1.0%) | 0 | 76(77.6%) |

Which of the above factors will be the **MOST IMPORTANT** to you as you recruit new professional staff? *Write the letters corresponding to up to 3 most important factors in the next five to ten years:*

a 6
**b 43**
**c 37**
d 5
e 5
**f 19**
**g 49**
h 5
**i 81**
**j 22**

7. If you as an employer currently provide support for professional staff in the library or information center for any of the following opportunities, please check the type of support you provide.

| | | |
|---|---|---|
| On-the-job training | | |
| ❑ release time | **1[1]=84(85.7%)** | **0=14(14.3%)** |
| ❑ funding | **1=64(65.3%)** | **0=34(34.7%)** |
| Attendance at conferences and continuing education courses | | |
| ❑ release time | **1=90(91.8%)** | **0=8(8.2%)** |
| ❑ funding | **1=85(86.7%)** | **0=13(13.3%)** |
| Participation in relevant internship programs | | |
| ❑ release time | **1=22(22.4%)** | **0=76(77.6%)** |
| ❑ funding | **1=8(8.2%)** | **0=90(91.8%)** |
| Participation in relevant advanced degree granting programs | | |
| ❑ release time | **1=36(37.9%)** | **0=60(61.2%)** |
| ❑ funding | **1=36(36.7%)** | **0=62(63.3%)** |
| Participation in relevant advanced certificate programs | | |
| ❑ release time | **1=41(41.8%)** | **0=57(58.2%)** |
| ❑ funding | **1=25(25.5%)** | **0=73(74.5%)** |
| Other; please specify: | | |
| ❑ release time | **1=6(6.1%)** | **0=92(93.8%)** |
| ❑ funding | **1=5(5.1%)** | **0=93(94.9%)** |

[1] Selection of this option was coded "1." Non-selection was coded "0."

8. Which of the following best expresses your philosophy as an employer?
*Please circle the number closest to your opinion.*

Continued professional growth is important for job retention:

1_____2_____3_____4_____5

*agree* *disagree*

**Mean 1.57732**
**Std Dev 0.76151**
**Variance 0.579897**

Continued professional growth is important for career advancement:

1_____2_____3_____4_____5

*agree* *disagree*

**Mean 1.541237**
**Std Dev 0.812244**
**Variance 0.65974**

Continued professional growth is the responsibility of the:

1_____2_____3_____4_____5

*employer* *employee*

**Mean 3.43299**
**Std Dev 0.8185**
**Variance 0.669942**

9. What is the level of support for professional growth you could envision offering a professional employee whom you want to retain? *Check as many as apply.*

❑ Up to one year paid time off
**1=3(3.1%) 0=95(96.9%)**

❑ Up to one year unpaid time off
**1=26(26.5%) 0=72(73.4%)**

❑ Full tuition for a one year program
**1=6(6.1%) 0=92(93.9%)**

❑ Full tuition for one year and partial salary
**1=3(3.1%) 0=95(96.9%)**

❑ Travel and time off to attend occasional conferences and CE courses
**1=93(94.9%) 0=5(5.1%)**

❑ Periodic time off over a longer period (e.g. one to two days a month for two years)
**1=57(58.2%) 0=41(41.8%)**

❑ Other; please specify:
**1=17(17.3%) 0=81(82.7%)**

❑ None of the above; all professional growth must occur in-house
**0=98(100%)**

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The remainder of this survey provides brief descriptions of five programs proposed to address the need for preparing information professionals with health sciences specializations. Please review the description of each program and respond to the subsequent questions.

The five proposed programs are:

- Master's Degree with Health Sciences Specialization;
- Advanced Internship Program;
- Certificate of Advanced Study;
- Executive Certificate of Advanced Study; and
- Ph.D. with Health Sciences Specialization.

***Master's Degree with Health Sciences Specialization***

The master's degree programs in library science/information science prepare students for professional employment in library service and the information industry. The proposed health sciences specialization will be compatible, in its general requirements, with the requirements of a non-specialized master's degree. It is expected that students in these programs will enter a career in health sciences librarianship and/or information management.

- **Specialized academic content emphasizes**: biomedical and health sciences information resources; design and evaluation of information services and programs; and health care environment. Internship/field experience and thesis also required.
- **Structure:** current length of the degree program (16 courses; 2 academic years full-time) will be required. Part-time student status possible.
- **Estimated annual cost:** tuition and fees for full-time student: $2,200 for North Carolina resident and $10,700 for out-of-state resident; this does not include books and materials or living expenses.

1. I would give preference in hiring professional staff to graduates of the program described above, other factors being equal. *Please circle the number closest to your opinion.*

   1_____2_____3_____4_____5

   *very likely* *not likely*

   **Mean 1.840206**
   **Std Dev 0.843314**
   **Variance 0.711179**

2. How likely would you be to support participation in this program (with release time and/or funding) by one of your staff members?

   1_____2_____3_____4_____5

   *very likely* *not likely*

   **Mean 3.819588**
   **Std Dev 1.229383**
   **Variance 1.511383**

3. Does this program address educational needs you have observed?

   ❑ No **23(23.5%)**
   ❑ Yes **67(68.4%)**
   **Missing 8(8.2%)**

***Advanced Internship Program (AIP)***

A post-master's work-site-based internship to expose new and experienced professionals to innovative practices and technologies in health information management. Customized to meet the educational needs of the individual with flexibility in the choice of sites and environments.

- **Content emphasizes**: supervised work experience at a host site, including a special project and final report.
- **Structure**: 6-month site-based internship; scheduled teleconferences, ongoing electronic discussions and/or online assignments will supplement experience. Certificate awarded upon completion.
- **Estimated cost**: $2,000 program fee; this does not include travel or living expenses at the internship site.

1. I would give preference in hiring professional staff to graduates of the program described above, other factors being equal.

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 2.005155**
   **Std Dev 0.966886**
   **Variance 0.934869**

2. How much importance would you associate with a professional staff person's participation in this program in evaluating that person's professional growth while on your staff?

   1_____2_____3_____4_____5
   *very important* *not very important*

   **Mean 2.347368**
   **Std Dev 0.997533**
   **Variance 0.995073**

3. How likely would you be to support participation in this program (with release time and/or funding) by one of your professional staff members?

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 3.375**
   **Std Dev 1.30384**
   **Variance 1.7**

4. Does this program address educational needs you have observed?

   ❑ No **12(12.2%)**
   ❑ Yes **71(72.4%)**
   **Missing 15(15.3%)**

***Certificate of Advanced Study (CAS)***

An on-campus, post-master's program designed for both new and experienced practitioners who seek an articulated and systematic continuing education program to redirect their career paths or to update their skills.

- **Content emphasizes**: design and evaluation of information services; creation, management and use of health information systems; health care environment; and advanced systems design and networking. Includes a major site-related project in a health sciences information setting.
- **Structure**: 30 credits (3 semesters full-time); primarily on-campus courses, supplemented with electronic/Web-supported materials.
- **Estimated annual cost**: tuition and fees for full-time student: $2,200 for North Carolina resident and $10,700 for out-of-state resident; this does not include books and materials or living expenses.

1. I would give preference in hiring professional staff to graduates of the program described above, other factors being equal.

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 2.244792**
   **Std Dev 1.061267**
   **Variance 1.126288**

2. How much importance would you associate with a professional staff person's participation in this program in evaluating that person's professional growth while on your staff?

   1_____2_____3_____4_____5
   *very important* *not very important*

   **Mean 2.494681**
   **Std Dev 1.101062**
   **Variance 1.212337**

3. How likely would you be to support participation in this program (with release time and/or funding) by one of your professional staff members?

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 3.968421**
   **Std Dev 1.108023**
   **Variance 1.227716**

4. Does this program address educational needs you have observed?

   ☐ No **19(19.4%)**
   ☐ Yes **67(68.4%)**
   **Missing 12(12.2%)**

***Executive Certificate of Advanced Study (ECAS)***

A post-master's program designed for currently employed information professionals, combining short on-campus sessions followed by independent study at the student's work site. Focuses on executive-level preparation. Provides opportunities to enrich and strengthen existing capabilities, develop subject or functional specialty, or to redirect a career.

- **Content emphasizes:** advanced management skills; advanced communications and presentation skills; health care environment; design and evaluation of information services; and creation, management and use of health information systems. Includes a major site-related project.
- **Structure:** 30 credits (two years part-time); on-campus time scheduled in periodic weekend seminars and summer institutes; scheduled teleconferences, ongoing electronic discussions and online assignments will supplement learning on campus. Program assumes participants will continue current employment.
- **Estimated total cost:** tuition and fees $4,500 for North Carolina resident, $10,500 for out-of-state resident; this does not include travel and living expenses for about 16 days, during five trips to campus.

1. I would give preference in hiring professional staff to graduates of the program described above, other factors being equal.

   1_____2_____3_____4_____5

   *very likely* *not likely*

   **Mean 2.416667**
   **Std Dev 1.323207**
   **Variance 1.750877**

2. How much importance would you associate with a professional staff person's participation in this program in evaluating that person's professional growth while on your staff?

   1_____2_____3_____4_____5

   *very important* *not very important*

   **Mean 2.569149**
   **Std Dev 1.236977**
   **Variance 1.530113**

3. How likely would you be to support participation in this program (with release time and/or funding) by one of your professional staff members?

1_____2_____3_____4_____5
*very likely* *not likely*

| | |
|---|---|
| **Mean** | **3.5** |
| **Std Dev** | **1.33289** |
| **Variance** | **1.776596** |

4. Does this program address educational needs you have observed?

| | |
|---|---|
| ❑ No | **25(25.5%)** |
| ❑ Yes | **61(62.2%)** |
| Missing | **12(12.2%)** |

***Ph.D. with Health Sciences Specialization***

The purpose of this doctoral program is to educate scholars who are capable of addressing problems of scholarly consequence in the fields of information and library science and, specifically, related to health sciences information management.

- **Content emphasizes**: research skills; design and evaluation of information services and programs; medical informatics; and creation, management, and use of health information systems. Includes a research practicum.
- **Structure:** minimum of 36 credits (2 years full-time) plus the dissertation; primarily on-campus courses in the School of Information and Library Science and other departments.
- **Estimated annual cost:** tuition and fees for full-time student: $2,200 for North Carolina resident, $10,700 for out-of-state resident; this does not include books and materials or living expenses.

1. I would give preference in hiring professional staff to graduates of the program described above, other factors being equal.

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 3.541667**
   **Std Dev 1.282815**
   **Variance 1.645614**

2. How much importance would you associate with a professional staff person's participation in this program in evaluating that person's professional growth while on your staff?

   1_____2_____3_____4_____5
   *very important* *not very important*

   **Mean 3.095745**
   **Std Dev 1.37034**
   **Variance 1.877831**

3. How likely would you be to support participation in this program (with release time and/or funding) by one of your professional staff members?

   1_____2_____3_____4_____5
   *very likely* *not likely*

   **Mean 4.221053**
   **Std Dev 1.105392**
   **Variance 1.221892**

4. Does this program address educational needs you have observed?

   ❑ No **35(35.7%)**
   ❑ Yes **50(51.0%)**
   **Missing 13(13.3%)**

**Inferential Statistical Analyses**

Inferential statistical analysis revealed significant findings among the data related to type of employer and type of support for continuing education.

- *On-the-Job (OTJ) Training.* Although there were cells with infrequent counts in the chi-square analysis of employer type by type of support for continuing education, the data suggest that academic employers appear to be more likely to provide release time for on-the-job (OTJ) training than hospital employers. The majority of all types of employers provide this type of support (84 who would versus 14 who would not), but academic employers appear to be even more likely than the other to provide release time for OTJ training. When looking at funding for OTJ training, academic are clearly more supportive than hospital employers (35 academic employers provide funding for OTJ training; 11 do not. Twenty-four hospital employers provide funding for OTJ training; 22 do not.)

- *Conference Attendance.* All types of employers are supportive of release time for attendance at conferences (90 of 98 respondents report providing this type of support), and there appears to be no difference across employer types. Similarly, in all categories there were more employers who provide funding for conference attendance than who were not. Academic employers appear particularly supportive of funding conference attendance. Forty-five of the 46 responding academic employers said they currently provide this type of support.

- *Internships.* Across all categories of employers, interest in supporting participation in internships was low (76 of the 98 would not provide release time, and 90 of the 98 would not provide funding). One third (35%) of academic employers, however, currently provide release time for internships.

- *Degree Programs.* Fifty-seven percent of academic employers provide release time for degree programs, while only 22% of hospital employers provide this type of support. But 46% of hospital employers provide funding for degree programs, in contrast to 24% of their academic colleagues who provide this type of support.

- *Certificate Programs.* Of the three types of employers, academic employers appear more willing than the others to provide release time for certificate programs. Fifty-nine percent of academic employers provide release time for certificate programs, while only 28% of hospital employers do the same. Funding for certificate programs as described in the survey is uniformly low.

TABLE OF INSTCODE BY RELEASE TIME FOR OTJ TRAINING

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 4 | 42 | 46 |
| | 6.5714 | 39.429 | |
| | 1.0062 | 0.1677 | |
| | 4.08 | 42.86 | 46.94 |
| | 8.70 | 91.30 | |
| | 28.57 | 50.00 | |
| Hospital | 7 | 39 | 46 |
| | 6.5714 | 39.429 | |
| | 0.028 | 0.0047 | |
| | 7.14 | 39.80 | 46.94 |
| | 15.22 | 84.78 | |
| | 50.00 | 46.43 | |
| Other | 3 | 3 | 6 |
| | 0.8571 | 5.1429 | |
| | 5.3571 | 0.8929 | |
| | 3.06 | 3.06 | 6.12 |
| | 50.00 | 50.00 | |
| | 21.43 | 3.57 | |
| Total | 14 | 84 | 98 |
| | 14.29 | 85.71 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 7.457 | 0.024 |
| Likelihood Ratio Chi-Square | 2 | 5.650 | 0.059 |
| Mantel-Haenszel Chi-Square | 1 | 5.036 | 0.025 |
| Phi Coefficient | | 0.276 | |
| Contingency Coefficient | | 0.266 | |
| Cramer's V | | 0.276 | |

Sample Size = 98

TABLE OF INSTCODE BY FUNDING FOR OTJ TRAINING

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 11 | 35 | 46 |
| | 15.959 | 30.041 | |
| | 1.541 | 0.8187 | |
| | 11.22 | 35.71 | 46.94 |
| | 23.91 | 76.09 | |
| | 32.35 | 54.69 | |
| Hospital | 22 | 24 | 46 |
| | 15.959 | 30.041 | |
| | 2.2865 | 1.2147 | |
| | 22.45 | 24.49 | 46.94 |
| | 47.83 | 52.17 | |
| | 64.71 | 37.50 | |
| Other | 1 | 5 | 6 |
| | 2.0816 | 3.9184 | |
| | 0.562 | 0.2986 | |
| | 1.02 | 5.10 | 6.12 |
| | 16.67 | 83.33 | |
| | 2.94 | 7.81 | |
| Total | 34 | 64 | 98 |
| | 34.69 | 65.31 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 6.722 | 0.035 |
| Likelihood Ratio Chi-Square | 2 | 6.828 | 0.033 |
| Mantel-Haenszel Chi-Square | 1 | 1.841 | 0.175 |
| Phi Coefficient | | 0.262 | |
| Contingency Coefficient | | 0.253 | |
| Cramer's V | | 0.262 | |

Sample Size = 98

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY RELEASE TIME FOR CONFERENCE ATTENDANCE

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 2 | 44 | 46 |
| | 3.7551 | 42.245 | |
| | 0.8203 | 0.0729 | |
| | 2.04 | 44.90 | 46.94 |
| | 4.35 | 95.65 | |
| | 25.00 | 48.89 | |
| Hospital | 5 | 41 | 46 |
| | 3.7551 | 42.245 | |
| | 0.4127 | 0.0367 | |
| | 5.10 | 41.84 | 46.94 |
| | 10.87 | 89.13 | |
| | 62.50 | 45.56 | |
| Other | 1 | 5 | 6 |
| | 0.4898 | 5.5102 | |
| | 0.5315 | 0.0472 | |
| | 1.02 | 5.10 | 6.12 |
| | 16.67 | 83.33 | |
| | 12.50 | 5.56 | |
| Total | 8 | 90 | 98 |
| | 8.16 | 91.84 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 1.921 | 0.383 |
| Likelihood Ratio Chi-Square | 2 | 1.929 | 0.381 |
| Mantel-Haenszel Chi-Square | 1 | 1.899 | 0.168 |
| Phi Coefficient | | 0.140 | |
| Contingency Coefficient | | 0.139 | |
| Cramer's V | | 0.140 | |

Sample Size = 98

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY FUNDING FOR CONFERENCE ATTENDANCE

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 1 | 45 | 46 |
| | 6.102 | 39.898 | |
| | 4.2659 | 0.6524 | |
| | 1.02 | 45.92 | 46.94 |
| | 2.17 | 97.83 | |
| | 7.69 | 52.94 | |
| Hospital | 12 | 34 | 46 |
| | 6.102 | 39.898 | |
| | 5.7007 | 0.8719 | |
| | 12.24 | 34.69 | 46.94 |
| | 26.09 | 73.91 | |
| | 92.31 | 40.00 | |
| Other | 0 | 6 | 6 |
| | 0.7959 | 5.2041 | |
| | 0.7959 | 0.1217 | |
| | 0.00 | 6.12 | 6.12 |
| | 0.00 | 100.00 | |
| | 0.00 | 7.06 | |
| Total | 13 | 85 | 98 |
| | 13.27 | 86.73 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 12.409 | 0.002 |
| Likelihood Ratio Chi-Square | 2 | 14.274 | 0.001 |
| Mantel-Haenszel Chi-Square | 1 | 4.472 | 0.034 |
| Phi Coefficient | | 0.356 | |
| Contingency Coefficient | | 0.335 | |
| Cramer's V | | 0.356 | |

Sample Size = 98

TABLE OF INSTCODE BY RELEASE TIME FOR INTERNSHIPS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 30 | 16 | 46 |
| | 35.673 | 10.327 | |
| | 0.9023 | 3.117 | |
| | 30.61 | 16.33 | 46.94 |
| | 65.22 | 34.78 | |
| | 39.47 | 72.73 | |
| Hospital | 40 | 6 | 46 |
| | 35.673 | 10.327 | |
| | 0.5247 | 1.8127 | |
| | 40.82 | 6.12 | 46.94 |
| | 86.96 | 13.04 | |
| | 52.63 | 27.27 | |
| Other | 6 | 0 | 6 |
| | 4.6531 | 1.3469 | |
| | 0.3899 | 1.3469 | |
| | 6.12 | 0.00 | 6.12 |
| | 100.00 | 0.00 | |
| | 7.89 | 0.00 | |
| Total | 76 | 22 | 98 |
| | 77.55 | 22.45 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 8.094 | 0.017 |
| Likelihood Ratio Chi-Square | 2 | 9.312 | 0.010 |
| Mantel-Haenszel Chi-Square | 1 | 7.855 | 0.005 |
| Phi Coefficient | | 0.287 | |
| Contingency Coefficient | | 0.276 | |
| Cramer's V | | 0.287 | |

Sample Size = 98
WARNING: 33% of the cells have expected counts less
than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY FUNDING FOR INTERNSHPS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 41 | 5 | 46 |
| | 42.245 | 3.7551 | |
| | 0.0367 | 0.4127 | |
| | 41.84 | 5.10 | 46.94 |
| | 89.13 | 10.87 | |
| | 45.56 | 62.50 | |
| Hospital | 43 | 3 | 46 |
| | 42.245 | 3.7551 | |
| | 0.0135 | 0.1518 | |
| | 43.88 | 3.06 | 46.94 |
| | 93.48 | 6.52 | |
| | 47.78 | 37.50 | |
| Other | 6 | 0 | 6 |
| | 5.5102 | 0.4898 | |
| | 0.0435 | 0.4898 | |
| | 6.12 | 0.00 | 6.12 |
| | 100.00 | 0.00 | |
| | 6.67 | 0.00 | |
| Total | 90 | 8 | 98 |
| | 91.84 | 8.16 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 1.148 | 0.563 |
| Likelihood Ratio Chi-Square | 2 | 1.609 | 0.447 |
| Mantel-Haenszel Chi-Square | 1 | 1.114 | 0.291 |
| Phi Coefficient | | 0.108 | |
| Contingency Coefficient | | 0.108 | |
| Cramer's V | | 0.108 | |

Sample Size = 98

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY RELEASE TIME FOR DEGREE PROGRAMS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 20 | 26 | 46 |
| | 28.163 | 17.837 | |
| | 2.3662 | 3.736 | |
| | 20.41 | 26.53 | 46.94 |
| | 43.48 | 56.52 | |
| | 33.33 | 68.42 | |
| Hospital | 36 | 10 | 46 |
| | 28.163 | 17.837 | |
| | 2.1807 | 3.4431 | |
| | 36.73 | 10.20 | 46.94 |
| | 78.26 | 21.74 | |
| | 60.00 | 26.32 | |
| Other | 4 | 2 | 6 |
| | 3.6735 | 2.3265 | |
| | 0.029 | 0.0458 | |
| | 4.08 | 2.04 | 6.12 |
| | 66.67 | 33.33 | |
| | 6.67 | 5.26 | |
| Total | 60 | 38 | 98 |
| | 61.22 | 38.78 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 11.801 | 0.003 |
| Likelihood Ratio Chi-Square | 2 | 12.083 | 0.002 |
| Mantel-Haenszel Chi-Square | 1 | 8.424 | 0.004 |
| Phi Coefficient | | 0.347 | |
| Contingency Coefficient | | 0.328 | |
| Cramer's V | | 0.347 | |

Sample Size = 98

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY FUNDING FOR DEGREE PROGRAMS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 35 | 11 | 46 |
| | 29.102 | 16.898 | |
| | 1.1953 | 2.0586 | |
| | 35.71 | 11.22 | 46.94 |
| | 76.09 | 23.91 | |
| | 56.45 | 30.56 | |
| Hospital | 25 | 21 | 46 |
| | 29.102 | 16.898 | |
| | 0.5782 | 0.9958 | |
| | 25.51 | 21.43 | 46.94 |
| | 54.35 | 45.65 | |
| | 40.32 | 58.33 | |
| Other | 2 | 4 | 6 |
| | 3.7959 | 2.2041 | |
| | 0.8497 | 1.4633 | |
| | 2.04 | 4.08 | 6.12 |
| | 33.33 | 66.67 | |
| | 3.23 | 11.11 | |
| Total | 62 | 36 | 98 |
| | 63.27 | 36.73 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 7.141 | 0.028 |
| Likelihood Ratio Chi-Square | 2 | 7.209 | 0.027 |
| Mantel-Haenszel Chi-Square | 1 | 7.067 | 0.008 |
| Phi Coefficient | | 0.270 | |
| Contingency Coefficient | | 0.261 | |
| Cramer's V | | 0.270 | |

Sample Size = 98

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY RELEASE TIME FOR CERTIFICATE PROGRAMS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 19 | 27 | 46 |
| | 26.755 | 19.245 | |
| | 2.2479 | 3.1251 | |
| | 19.39 | 27.55 | 46.94 |
| | 41.30 | 58.70 | |
| | 33.33 | 65.85 | |
| Hospital | 33 | 13 | 46 |
| | 26.755 | 19.245 | |
| | 1.4576 | 2.0264 | |
| | 33.67 | 13.27 | 46.94 |
| | 71.74 | 28.26 | |
| | 57.89 | 31.71 | |
| Other | 5 | 1 | 6 |
| | 3.4898 | 2.5102 | |
| | 0.6535 | 0.9086 | |
| | 5.10 | 1.02 | 6.12 |
| | 83.33 | 16.67 | |
| | 8.77 | 2.44 | |
| Total | 57 | 41 | 98 |
| | 58.16 | 41.84 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 10.419 | 0.005 |
| Likelihood Ratio Chi-Square | 2 | 10.678 | 0.005 |
| Mantel-Haenszel Chi-Square | 1 | 9.788 | 0.002 |
| Phi Coefficient | | 0.326 | |
| Contingency Coefficient | | 0.310 | |
| Cramer's V | | 0.326 | |

Sample Size = 98

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF INSTCODE BY FUNDING FOR CERTIFICATE PROGRAMS

| Frequency<br>Expected<br>Cell Chi-Square<br>Percent<br>Row Pct<br>Col Pct | 0 | 1 | Total |
|---|---|---|---|
| Academic | 35 | 11 | 46 |
| | 34.265 | 11.735 | |
| | 0.0158 | 0.046 | |
| | 35.71 | 11.22 | 46.94 |
| | 76.09 | 23.91 | |
| | 47.95 | 44.00 | |
| Hospital | 35 | 11 | 46 |
| | 34.265 | 11.735 | |
| | 0.0158 | 0.046 | |
| | 35.71 | 11.22 | 46.94 |
| | 76.09 | 23.91 | |
| | 47.95 | 44.00 | |
| Other | 3 | 3 | 6 |
| | 4.4694 | 1.5306 | |
| | 0.4831 | 1.4106 | |
| | 3.06 | 3.06 | 6.12 |
| | 50.00 | 50.00 | |
| | 4.11 | 12.00 | |
| Total | 73 | 25 | 98 |
| | 74.49 | 25.51 | 100.00 |

| Statistic | DF | Value | Prob |
|---|---|---|---|
| Chi-Square | 2 | 2.017 | 0.365 |
| Likelihood Ratio Chi-Square | 2 | 1.771 | 0.412 |
| Mantel-Haenszel Chi-Square | 1 | 0.709 | 0.400 |
| Phi Coefficient | | 0.143 | |
| Contingency Coefficient | | 0.142 | |
| Cramer's V | | 0.143 | |

Sample Size = 98

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

**Employers' Other Factors for Current Hires (Question 5J)**

Diplomacy

Interest in Medicine

Skill sets

Interpersonal skills

Knowledge of electronic resources & information technology

Native inteligence, (2- grad.degree in info technology)

Experience in applications of advanced technologies

Team work & team training

Specific skills: eg., online searching, PC familiarity.

Honesty, dedication enthusiasm

Technology skills & training

Administrative skills

Quality improvement & team knowledge/experience

Computer literacy

Computer skills

Service attitude

Customer-oriented perspective

Computer-related skills

Info technology apptitude/enthusiasm

Hospital lib. or other broad prof. experience

Instructional, computer-related skills

Info tech knowledge & experience

Computer/internet uses/comfort level

Internships during MLS training

**Employers' Other Factors for Future Hires (Question 6J)**

Electronic info know computer literacy

Interest in Medicine

Skill sets

Interpersonal skills and communication, training experience

Knowledge & skill with web resources

Graduate degree in info tech, native intelligence

Expertise in computer system operations, troubleshooting, on all platforms

Experience in applications of advanced technologies

Informatics training

Specific skills: searching, HTML. LAN management, etc.

Technology skills & training

Administrative skills

Change management in daily work life

Teaching ability

Computer training

Service attitude

Customer service perspective

Computer-related skills

IT

Computer-related skills, ability to work as team member, customer serviec skills/orientation

Instructional, computer-related skills

Info tech knowledge & experience

Knowledge of info sys., analytical mind, ability to integrate info.

Comp/internet skills

Internships

## STUDENT FOCUS GROUP QUESTIONS

- Describe your level of interest in health sciences librarianship. What are the characteristics of the field that appeal to you? What factors led to your interest in specializing in the health sciences?
- What setting would you prefer to work in? Why? Describe the function or role you see yourself performing in your first professional position.
- How would a health sciences specialization affect your search for your first professional position? What resources will you use to find your first professional position? What factors will affect your choice of job opportunities?
- What do you see as necessary preparation for work in a health sciences setting? What knowledge and skills do you expect to bring with you in your first professional position?
- If a university were planning a health sciences track for master's students, what should it entail? What would make it attractive to you?
- What knowledge and skills do you expect to acquire on the job? How will you acquire these? How will you keep up to date with new practices once you're working in the field?

**Proposal for**
**Master of Science in Library Science**
**And**
**Master of Science in Information Science**
**with a**
**Specialization in Health Sciences**

*Prepared by Claudia Gollop*

The MLA Task Force identified seven knowledge and skills areas important to the practice of librarianship and the provision of information in the health sciences. Those areas are:

- health sciences environment and information policies;
- health sciences information services;
- health sciences resource management;
- information systems and technology;
- management of information services;
- instructional support systems; and
- research, analysis, and interpretation.

This proposal offers course content and practicum situations that respond directly to those seven areas and that provide students with the knowledge and skills necessary to begin a professional career as well as to build on that career in health sciences information.

**Overview of Program Requirements**

The two Master's degree programs will require forty-eight semester hours of graduate course work drawn from the School's course offerings and from appropriate subject fields provided by courses available in other departments on the UNC-CH campus. Requirements for the Master's degrees also include two semesters of residence, as described in the Graduate School Catalog; admission to comprehensive examination; and completion of a Master's paper or project.

Admission requirements include a bachelor's degree from an accredited college or university; a GPA of 3.0 or better (on a 4.0 scale); acceptable score on the GRE (taken within the last five years); a strong liberal arts and sciences background; and a minimum TOEFL score of 550, with a minimum score of 50 on each section, for applicants whose native language is not English.

**Master of Science in Library Science**

The M.S.L.S. with a concentration in health sciences would prepare students for professional employment in health sciences libraries and health-related information agencies and organizations.

The Master's program in Library Science will continue to require students to complete courses from the School's course offerings. In addition to the standard prerequisite curriculum which includes courses in Organization of Materials, Information Resources and Services, Collection Development, Communications, and Management, students would also be required to take other courses, such as

Science Information, Health Sciences Information, Telecommunications, and Medical Informatics. Students might also be required to enroll in a field practicum in a setting with a health sciences focus, such as an Area Health Education Center (AHEC), the National Institute for Environmental and Health Services (NIEHS) Library, the Environmental Protection Agency (EPA) Library. Several opportunities for practical experience are available in the Chapel Hill/Durham/Raleigh area.

**Master of Science in Information Science**

The Master of Science in Information Science with a concentration in health sciences would prepare students for professional employment in information agencies and organizations affiliated with the biomedical and health sciences areas. In addition to the standard curriculum, which includes courses in Information Retrieval, Systems Analysis, and Organization of Information, students might also be required to take other courses, such as Science Information, Health Sciences Information, Medical Informatics, and Information Management in Health Policy and Administration. Students might also be required to enroll in a field practicum at an Area Health Education Center (AHEC) or at UNC Hospitals, to get exposure to the health professional education and clinical environments. Other nearby practicum sites might include a pharmaceutical company, a government-sponsored health research agency, and a health maintenance organization (HMO), all of which are available in the Research Triangle.

**Academic Content**

Of the forty-eight semester hours necessary for successful completion of the Master's programs, twenty-one of those credit hours will continue to be used for required courses (e.g., those course mentioned above). While the remaining elective courses build upon those required, eighteen semester hours (five courses, plus one practicum) of course work with a biomedical and health sciences information focus will be required to create a "major" in health sciences in either Master's program. Thus far, only one new course is scheduled to be developed for the health sciences concentration (see 2xx below), although it is very possible that the development of other courses may be warranted as the programs progress. Course offerings located at schools and departments on UNC's campus include:

**School of Information and Library Science**

222 **Science Information** (3). Prerequisite, INLS 150 or 172. Survey of the communication of scientific information and the information sources in the physical and biological sciences; emphasis on major bibliographic and fact sources including online reference services. Required

225 **Health Sciences Information** (3). Prerequisite, INLS 150 or 172. A survey of information used in the health sciences disciplines and professions. The organization of sources, current techniques, and tools for control including online databases. **(should be altered to include service issues)** Required

2xx **Health Care Environment** (3). Environmental issues relevant to health care and biomedical information organizations, such as academic health sciences libraries, pharmaceutical

information centers, and managed care organizations. Course includes case studies, information needs assessments, and expert presentations and discussions. Required

**School of Public Health**

Department of Epidemiology (EPID)

168 **Fundamentals of Epidemiology** (4). (EPID). An intensive introduction to epidemiological concepts and methods for students intending to engage in, collaborate in, or interpret the results of epidemiologic studies. Some familiarity with biomedical concepts may be needed.

220 **Health Promotion/Disease Prevention and Behavioral Epidemiology** (3). (EPID). Selected topics on the role of lifestyle behavior in modern illness and on conceptual, methodologic, substantive, and policy issues in health promotion/disease prevention.

Department of Health Behavior and Health Education (HBHE)

130 **Social and Behavioral Science Foundations of Health Education** ( var.). (HBHE). Selected social and behavioral science theories and concepts that apply to the analysis of health related behavior and to the generation of intervention strategies.

172 **Planning Health Promotion in Medical and Worksite Settings** (4). (HBHE). Course builds skills in developing the components of health care and worksite health promotion programming; including needs assessment, message development, message channel options, health counseling, and training.

212 **Citizen Participation in Community Health Decision Making** (1-4). (HBHE). Theories and concepts of citizen participation in community health settings; an historical review of mandated citizen participation; and strategies for enhancing citizen's ability to influence the social policy process.

225 **Health Communication Theory and Research** (3). (HBHE). Overview of communication of theory and research and critical analysis of applications of communication of theory to health education and health behavior intervention.

Department of Health Policy and Administration (HPAA)

101 **Information Management in Health Policy and Administration** (1). ( HPAA) Introduces students to methods for critically evaluating public health literature and using computers to identify, file, and retrieve information.

176 **Introduction to Health Services Research** (3). (HPAA). Provides systematic introduction to selected methods for health services research, health services research literature, and research writing.

180 **Health Law** (3). (HPAA). The law and the legal decision-making processes and their

relationship to the delivery of health services.

185 **Ethical Issues** (3). HPAA. Nature of ethical thought and reasoning; contributions of religion and science; historical and current issues. Sections on professional practice issues and health policy issues.

**School of Medicine**

Department of Biomedical Engineering (BMME)
Medical Informatics Program

170 **Introduction to Medical Informatics** (3). (BMME). Offered jointly with Duke University, the course reviews existing information systems for supporting inpatient and ambulatory care; contrast and compare
requirements of those systems; and financial and administrative requirements.

171 **Medical Information Systems** (4). (BMME). Introduction to the rudiments of database construction; issues of system reliability, data security, and to the storage and retrieval of images and other non-traditional data types.

270 **Research and Evaluation Methods in Medical Informatics** (3). (BMME). Topics include quasi-experiments, with emphasis on design and appropriate choice of statistical analysis; non-experimental research techniques; factor analyses; and descriptive techniques.

271 **Clinical Reasoning and Decision Making** (3). (BMME). Addresses structured approaches to clinical decision making. Topics include models of human problem-solving, expert-novice differences and the development of clinical expertise, and knowledge representation.

Students have the option of applying the remaining nine semester hours to still more courses in the health sciences areas or they may take other appropriate courses for which they are eligible, both within SILS or in the schools and departments located on campus.

**Evaluation of Programs**

Appropriate, objective evaluative measures will be employed to gauge the progress of the programs and to observe any need for alterations. This will be particularly critical in the initial stages of the M.S.L.S. and M.S.I.S. programs.

**Other issues**

The admission and course requirements for both Master's programs will go unchanged. However, other issues must be considered including the additional resources that will be needed in order to facilitate a specialization in health sciences. For example:

- An administrator to at lease, initially, set up the program and track its progress.

- Additional teaching staff will be needed should SILS develop additional courses and/or offer health sciences related courses more frequently. This could be accomplished with adjunct faculty or offering overload salary compensation.
- Related to the above issue is the financial burden to SILS and the University.
- Agreements must be made with UNC schools and departments, particularly in the Health Affairs division where several SILS students would want to take classes.
- Appropriate evaluative methods for such a program.
- What should the relationship be with the Medical Library Association?

**DRAFT, 6/2/97**

**Proposal for**

# EXECUTIVE CERTIFICATE OF ADVANCED STUDY, with specialization in health information management

*Prepared by Barbara Wildemuth*

This proposal summarizes the changes to the current CAS program that would be required to offer is as an Executive CAS (ECAS) program. Unless noted, the current Catalog description of the CAS program applies to the ECAS.

## *Basic overview of program*

The following section should be substituted for the current CAS description in the Catalog:

"The Executive Certificate of Advanced Study (ECAS) is a post-master's degree program that is designed for currently employed information professionals, combining short on-campus sessions followed by independent study at the student's work site. The focus of the program is on executive-level preparation. It provides opportunities for students to enrich and strengthen existing capabilities, develop subject or functional specialty, or to redirect a career. [Four areas] of specialization are now available: Health Information Management, [Academic Library Management, Databases and Information Retrieval, and Telecommunications and Networking]."

Note: I've listed four areas here; I believe SILS should begin with two and expand after initial evaluation.

## *Requirements for Admission to the Post-Master's Program*

No changes are needed to the current requirements. They include: an IS/LS master's degree with at least a 3.0 GPA and, for those whose native language is not English, a minimum TOEFL score of 550, with a minimum score of 50 on each of the three sections of the test. Additional requirements would include: five years professional experience with some in a health sciences setting, computer competency, and access to technology needed for participation in program.

## *Application for Admission*

Only one change is needed to the application procedures. We will need to require a current vitae or resume (assuming that information is not already gathered via the application forms), to get a sense of the "executive" potential of the applicant. We may also wish the applicant to nominate an on-site mentor at the time of application.

The items required currently are the Graduate School and SILS application forms; transcripts; an essay on career goals, area of study interest, and reasons the CAS program will meet the applicant's

needs; and three letters of reference. An interview *may* be required currently; it may be appropriate to interview *all* the ECAS applicants.

***Expected Effort***

Here are some assumptions concerning the level of effort for the students. These assumptions are not meant to be included in the Catalog, but are useful for planning.

Current expectations for graduate students:

30 credits = 10 courses
One 3-credit course = 3 hours in class each week plus 6-9 hours outside class each week = 126-168 hours of effort for 14 week course
Total effort = 1260-1680 hours spread over two years

Modifications for distance education:

Assume 10 months of effort each year
63-84 hours of effort each month during the program

***Program Schedule*** (not for inclusion in Catalog)

Three sessions each year:

Session I: August through November (6 credits)
Session II: January through April (6 credits)
Session III: mid-May through mid-July (3 credits)

Session I schedule:

August, first weekend, Wednesday-Saturday on campus
September, third week, half-day videoconference
September, fourth week, half-day videoconference
November, weekend before Thanksgiving, Friday-Saturday on campus

Session II schedule:

January, first weekend, Wednesday-Saturday on campus
February, third week, half-day videoconference
February, fourth week, half-day videoconference
April, last weekend, Friday-Saturday on campus

Session III schedule:

May, second or third week, Thursday-Saturday on campus
July, second or third week, half-day videoconference

First on-campus meeting of each session will include orientation to class(es), class meetings, and technology training as needed. Videoconferences will be class meetings, one for each class during the session. Second on-campus meeting of each session will include any student presentations, exams or evaluation exercises, and wrap-up.

***Program Content***

The current CAS description emphasizes flexibility and the customizability of the program for each entering student. This proposal assumes that, rather than maximum flexibility, each ECAS specialization would be tightly defined, with only a few options available each session. The following schedule of content assumes that students could start in Session I of either year.

Year 1, Session I

*INLS 234, Human Resources Management.* Prerequisite: INLS 131. An in-depth look at the management of human resources in libraries and other information agencies. Includes topics such as recruitment, hiring, job analysis, performance appraisal, training and compensation. Moran.

*INLS 256, Database Systems* (alternative to BMME 171). Prerequisites: INLS 102 and INLS 162. A study of the relational database model including entity-relationship theory, design, normalization techniques and query language. Haas, M. P. Smith.

*BMME 171, Medical Information Systems* (alternative to INLS 256). Database construction, including entity-relationship diagrams, with special emphasis on special representation issues raised by medical information. Fritsch.

Year 1, Session II

*INLS 222, Science Information* (alternative to HPAA 107). Prerequisite: INLS 111. Survey of the communication of scientific information and the information sources in the physical and biological sciences; emphasis on major bibliographic and fact sources including online reference services. Deitch.

*HPAA 107, Theory and Practice of Public Health Policy and Administration* (alternative to INLS 222). Policy and management issues and ideals, including their historical derivations and international implications, in relation to current state and local practice. (Currently offered as part of HPAA's executive master's program.)

*INLS 257, User Interface Design.* Prerequisite: INLS 162. Basic principles for designing the human interface to information systems, emphasizing computer-assisted systems. Major topics: users' conceptual models of systems, human information processing capabilities, styles of interfaces and evaluation methods. Wildemuth.

Year 1, Session III

*INLS 3xx, On-site Project* (may be taken in Year 1 or Year 2). A major site-related project, to be developed cooperatively with a faculty supervisor and an on-site supervisor.

*INLS 2xx, Financial Management* (may be taken in Year 1 or Year 2). Various approaches to budgeting, with emphasis on planning for program and/or technology implementation.

Year 2, Session I

*INLS 225, Health Sciences Information* (alternative to INLS 232). Prerequisite: INLS 111. A survey of information used in the health sciences disciplines and professions: the organization of sources, current techniques and tools for its control including online databases. Gollop.

*INLS 232, Library Effectiveness* (alternative to INLS 225). Application of systematic

analytical methods to the problems of management and organization. Emphasis on the use of selected techniques in designing the solutions to problems in library and information service. Shaw.

*INLS 2xx, Management of Networks and Telecommunications.* Basic overview of technical issues in networking and telecommunications. In-depth discussion of management issues, including productivity issues, collaborative work, security, and others.

Year 2, Session II

*INLS 311, Seminar in Information Services.* Prerequisite: INLS 111 and pre- or corequisite: INLS 211. Administrative and professional issues in the provision of reference and information services; includes policy development implementation, facilitation of communication, ethics, integration and implementation of information technologies and management and evaluation of information services. Tibbo.

*HPAA or BMME xxx, Current Issues in the Health Care Environment.* To be developed.

Year 2, Session III

*INLS 3xx, On-site Project* (may be taken in Year 1 or Year 2). A major site-related project, to be developed cooperatively with a faculty supervisor and an on-site supervisor.

*INLS 2xx, Financial Management* (may be taken in Year 1 or Year 2). Various approaches to budgeting, with emphasis on planning for program and/or technology implementation.

It is presumed that new courses would be developed, as necessary. In addition, it is presumed that current courses would be offered concurrently in the structure required by the ECAS and in the structure required for on-campus classes. To accomplish this flexibility in course structures, maximum course sizes may need to be reduced, in order to establish equitable teaching loads. An alternative is to offer these courses only in the format needed for the ECAS program; in this case, some class sizes would still need to be reduced.

***Certificate Requirements***

There are a few changes needed for the ECAS. There should be no need for a requirement of computer competency; if necessary, this should be included as an admissions requirement. There will be no need for a "written review"; this will be a coursework-only certificate. The five-year limit on completion should remain the same.

***Transfer of Credits***

There will be no substantive changes in the policies for transfer of credits. Credits should be accepted for transfer only if they substitute for the required courses listed under *Program Content*.

***Issues to Be Resolved***

Several issues relating to the feasibility of this program (and other ECAS specializations) need to be resolved. They include:

*Teaching responsibilities: class size.* Is it feasible for someone to teach an ECAS version and a "regular" version of a course as the equivalent of one course of teaching load? What implications does this really have for class sizes? Over the last two offerings of each SILS course listed above, class sizes have ranged from 6 (INLS 232 in 1994) to 28 (INLS 222 in 1996), averaging 17 students per section.

*Teaching responsibilities: faculty.* Will any current faculty member be willing to teach in the ECAS program? Even if paid for overload, faculty may not be interested. Are there qualified adjunct faculty available?

*Size of cohort.* How many students should be admitted to this program/specialization each year? Can enough students be recruited to make it worthwhile?

*Additional courses.* Can qualified faculty be identified to teach the new courses proposed?

## PHD IN INFORMATION AND LIBRARY SCIENCE WITH HEALTH SCIENCES SPECIALIZATION

*Prepared by Keith Cogdill*

### Statement of Purpose

The purpose of the doctoral program in the School of Information and Library Science is to educate scholars who are capable of addressing problems of scholarly consequence in the field of information and library science. With a health sciences specialization scholars are prepared to address problems related to the communication and retrieval of information in health care.

### Educational Objectives

Graduates with a health sciences specialization are prepared to engage in productive research in such settings as academic health sciences centers, government agencies and other health-related organizations in which problems of communication and retrieval are addressed.

### Scope of the Health Sciences Specialization

The health sciences specialization builds on the scope of the doctoral curriculum in information and library science. Graduates with a health sciences specialization complete a minor in medical informatics. The combination of the doctoral curriculum and the medical informatics minor prepares students to identify and address research problems in the areas of communication and information retrieval in health care.

The following are the requirements for a minor in medical informatics.

- The student must complete the core curriculum in the medical informatics program. The core curriculum includes the following courses: introduction to medical informatics (BMME 170); research design and evaluation in medical informatics (BMME 270); clinical reasoning and decision making (BMME 271); and medical information systems (BMME 171).
- For any minor, the student must present at least fifteen credit hours taken in a program other than information and library science. For a minor in medical informatics all fifteen hours may be taken in the medical informatics program or some may be taken in another health-related program with at least six hours in each program.
- The student with a health sciences specialization must have completed INLS 225 Health Science Information or have demonstrated equivalent professional or academic experience.

# SCHOOL OF INFORMATION AND LIBRARY SCIENCE

*NOTE: The prefix for all School of Information and Library Science courses is INLS. When a prerequisite or corequisite is listed for a course, it may be assumed that an equivalent course taken elsewhere or permission of instructor also fulfills the prerequisite or corequisite. The course instructor must approve the equivalency of the substitute course. Although graduate students may take courses numbered below 100, they will not receive credit toward a graduate degree for those courses. Undergraduate juniors and seniors may take courses numbered 1 through 199.*

**50 Introduction to Computing (3).** *Viles.* Study of the functional capabilities of major classes of microcomputer application software, the computing needs of information agencies, and selected current topics in computing.

**60 Information Systems Analysis and Design (3).** *Wildemuth. Prerequisite or corequisite: INLS 50.* Analysis of organizational problems and how information systems can be designed to solve those problems. Application of database and interface design principles to the implementation of information systems.

**70 Organizing and Retrieving Information (3).** *Viles, Wildemuth. Prerequisite: INLS 50.* Methods for organizing and retrieving information, including using existing databases and the construction of a database using a database management software package.

**80 Data Communication (3).** *Dempsey, Newby. Prerequisite: INLS 50.*
Examines the functions of data communication networks such as the Internet for communication, accessing remote resources, and information searching and retrieval. Explores emerging multimedia applications and their potential uses.

**90 Independent Study in Information Systems (1-3).** *Staff.* Study by an individual student on a special topic under the direction of a specific faculty member. A prospectus/plan for the work is required in advance of registration.

**108 History of Books and Libraries (3).** *Saye.* The history of human communication focusing on the origin and development of the book and the origin and development of libraries and librarianship.

**110 Selected Topics (3).** *Members of the faculty.* Exploration of an introductory-level special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict their future availability; new courses may replace these. Courses offered during 1996-97 include:

**110(70) Introduction to Hypermedia.** *Christensen.*
**110(76) Introduction to Communication Networks.** *Dempsey.*
**110(78) Information Systems Analysis and Design.** *Barreau. (Now INLS 60)*
**110(79) Organizing and Retrieving Information.** *Mangrum. (Now INLS 70)*



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**111 Information Resources and Services I (3).** *Gollop, Tibbo.* Analysis, use, and evaluation of information and reference systems, services, and tools with attention to printed and electronic modes of delivery. Provides a foundation in search techniques for electronic information retrieval, question negotiation, and interviewing.

**115 Natural Language Processing (Computer Science 171) (3).** *Haas. Prerequisite: COMP 14 or COMP 15.* Statistical, syntactic, and semantic models of natural language. Tools and techniques needed to implement language analysis and generation processes on the computer.

**120 History of Children's Literature (3).** *Staff.* A survey of children's literature in English from the Middle Ages through the nineteenth century.

**122 Young Adult Literature and Related Materials (3).** *Staff.* A survey of print and nonprint library materials particularly suited to the needs of adolescents.

**123 Children's Literature and Related Materials (3).** *Staff.* Survey of literature and related materials for children with emphasis on twentieth-century authors and illustrators.

**131 Management of Information Agencies (3).** *Chatman, Daniel.* An introduction to management in libraries and other information agencies. Topics to be studied include planning, budgeting, organizational theory, information sources for managers, staffing, leadership, organizational change, and decision making.

**150 Organization of Information (3).** *Solomon.* Introduction to the problems and methods of organizing information, including information structures, knowledge schemas, data structures, terminological control, index language functions, and implications for searching.

**151 Organization of Materials I (3).** *Saye. Prerequisite or corequisite: INLS 50.* An introduction to the problems of organizing information and collections of materials. Formal systems for cataloging and classifying are studied.

**153 Resource Selection and Evaluation (3).** *Pierce.* Identification, provision, and evaluation of resources to meet primary needs of clienteles in different institutional environments.

**161 Non-numeric Programming for Information Systems Applications (3).** *Losee.* An introduction to computer programming for library operations and information retrieval applications.

**162 Systems Analysis (3).** *Haas, Sonnenwald, Wildemuth.* Introduction to the systems approach to the design and development of information systems. Methods and tools for the analysis and modeling of system functionality (e.g., structured analysis) and data represented in the system (e.g., object-oriented analysis) are studied.

**165 Records Management (3).** *Staff.* Introduces the principles of records center design, records analysis and appraisal, filing systems, reprographics and forms, reports, and correspondence management. Legal issues and the security of records are also covered.

**170 Applications of Natural Language Processing (Computer Science 170) (3).** *Haas. Prerequisite: COMP 14, 15, or graduate standing in Information and Library Science.*
Study of applications of natural language processing techniques and the representations and processes needed to support them. Topics include interfaces, text retrieval, machine translation, speech processing, and text generation.

**172 Information Retrieval (Computer Science 172) (3).** *Losee, Shaw. Prerequisite: INLS 50, COMP 14, or COMP 15.* Study of information retrieval and question answering techniques, including document classification, retrieval and evaluation techniques, handling of large data collections, and the use of feedback.

**174 Telecommunications Systems (3).** *Losee. Prerequisite: INLS 50.* Digital and analog forms of electronic communication. Design and performance of networks and their relationship to libraries and information agencies.

**176 Information Models (3).** *Haas.* An introduction to models and modeling techniques used in information science and their application to problems and issues in the field.

**180 Communication Processes (3).** *Chatman, Daniel, Sonnenwald, Wildemuth.* Examines the social and technological processes associated with the transfer of information and includes discussions of formal and interpersonal communication channels.

**181 Internet Applications (3).** *Barker, Collins, Dempsey, Rhine. Prerequisite: INLS 50.* Introduction to Internet concepts, applications, and services. Introduces the TCP/IP protocol suite along with clients and servers for Internet communication, browsing, and navigation. Examines policy, management, and implementation issues.

**182 Introduction to Local Area Networks (3).** *Rankin. Prerequisite: INLS 50.* Introduction to local area network hardware, topologies, operating systems, and applications. Also discusses LAN management and the role of the network administrator.

**184 Protocols and Network Management (3).** *Gogan. Prerequisite: INLS 181 or INLS 182.* Network protocols and protocol stacks. Included are discussions of protocol classes, packet filtering, address filtering, network management, and hardware such as protocol analyzers, repeaters, routers, and bridges.

**186 TCP/IP Networking and Network Programming (Computer Science 143). (3).** *Dempsey. Prerequisites: (INLS 161, 184) or COMP 142.* In-depth examination of the algorithms underlying the TCP/IP Internet protocol suite, including performance issues and operational problems. Introduction to client/server network programming (in C/C++/Java) using the standard BSD sockets interface.

**201 Research Methods (3).** *Losee, Pierce, Solomon. Prerequisite: completion of twelve semester hours.* An introduction to research methods used in library and information science. Includes the writing of a research proposal.

**203 Information Systems Effectiveness (3).** *Wildemuth. Prerequisite: INLS 201 recommended.* Addresses issues of performance measurement and methodology in the evaluation of information systems and services. The roles of objectives, performance measures, data collection approaches, and analytical approaches will be considered.

**204 International and Comparative Librarianship (3).** *Staff.* The concepts of the library's role in other countries; trends in international cooperation; American participation in international library-related organizations and programs.

**210 Intermediate Selected Topics (3).** *Members of the faculty.* Exploration of an intermediate-level special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict their future availability; new courses may replace these. Courses offered during 1996-97 include:

**210(32) Evaluation of Information Retrieval Systems.** *Shaw.*
**210(39) Qualitative Research Methods.** *Chatman.*
**210(53) Library Automation.** *Kochtanek.*
**210(73) Strategies and Tools to Support Collaboration.** *Sonnenwald.*
**210(76) TCP/IP Networking and Network Programming.** *Dempsey. (Now INLS 186)*
**210(80) Enterprise Strategy and Information Technology.** *Hainline.*

**211 Information Resources and Services II (3).** *Gollop, Tibbo. Prerequisite: INLS 111.* Further explores information and reference systems, services, and tools with a focus on databases. Investigates effective information retrieval techniques, end-user instruction, and the management of electronic information services.

**213 User Perspectives in Information Systems and Services (3).** *Solomon.* Explores the roles of information in human activity. Resulting insights are directed toward design of user-oriented systems. Psychological, social, economic, political, task, and other situational perspectives are taken.

**222 Science Information (3).** *Deitch. Prerequisite: INLS 111.* Survey of the communication of scientific information and the information sources in the physical and biological sciences; emphasis on major bibliographic and fact sources, including online reference services.

**224 Humanities and Social Science Information (3).** *Pierce. Prerequisite: INLS 111.* Survey of information and its needs in the social sciences and humanities, with an emphasis on information use and search strategies and on reference and other information resources.

**225 Health Sciences Information (3).** *Gollop. Prerequisite: INLS 111.* A survey of information used in the health sciences disciplines and professions: the organization of sources, current techniques, and tools

for its control, including online databases.

**226 Serials (3).** *Tuttle. Prerequisites: INLS 111 and INLS 151.* Survey of technical and public services aspects of library serials management, including organization, collection development, acquisition, cataloging, access, and preservation. Covers serials publishing and the role of the subscription agent.

**227 Business Information (3).** *Strauss. Prerequisite: INLS 111.* Combines an introduction to basic business concepts and vocabulary with consideration of current issues in business librarianship and of key print and electronic information sources.

**228 Public Documents (3).** *Staff. Prerequisite: INLS 111.* A survey of the major publications of the United States federal government, United Nations, and British government, with attention to the selection, classification, and administration of a document collection.

**229 Law Libraries and Legal Information (3).** *Gasaway. Prerequisite: INLS 111.* An introduction to the legal system and the development of law libraries, their unique objectives, characteristics, and functions. The literature of Anglo-American jurisprudence and computerized legal research are emphasized as well as research techniques.

**232 Library Effectiveness (3).** *Shaw.* Application of systematic analytical methods to the problems of management and organization. Emphasis on the use of selected techniques in designing the solutions to problems in library and information service.

**233 Managing in the Information Systems Organization (3).** *Staff.* Prerequisite: INLS 131 eecommended. Presents the broad scope of responsibilities inherent in information systems management. Topics include management controls, security, maintenance, human resources requirements, and associated issues of information system planning and development.

**234 Human Resources Management (3).** *Moran. Prerequisite: INLS 131.* An in-depth look at the management of human resources in libraries and other information agencies. Includes topics such as recruitment, hiring, job analysis, performance appraisal, training, and compensation.

**237 Marketing of Information Services (3).** *Daniel.* Application of marketing theory to libraries and other information settings. Includes consumer behavior, market research, segmentation, targeting and positioning, public relations, product design, and sales promotion.

**239 Strategic Planning (3).** *Daniel. Prerequisite: INLS 131 recommended.* Emphasizes the role of information in organizational planning processes. Topics include strategy development, goal formation, long-range planning, environmental scanning, and the use of information systems/products for competitive advantage.

**241 The School Library Media Center (3).** *Daniel.* Philosophy and mission of the school library

media center in context of the educational environment. Considers program planning and evaluation, policy development, and examination of current issues.

**242 Curriculum Issues and the School Librarian (3).** *Daniel.* Considers the educational process, methods of teaching, scope, and sequence of curricular content in grades K-12. Examines the role of the library media specialist in providing access, instruction, and consultation.

**243 Administration of Public Library Work with Children and Young Adults (3).** *Staff.* Objectives and organization of public library services for children and young adults; designed for those who may work directly with young people or who intend to work in public libraries.

**244 Administration of Archives and Manuscript Collection (3).** *Tibbo.* The history, principles, and techniques of acquiring and administering public and private archives and manuscript collections. Instruction will be supplemented by special lectures and tours of nearby record repositories.

**246 Music Librarianship (3).** *Reed.* Survey of the history and practice of music librarianship, with an emphasis on administration, collection development, and public service in academic and large public libraries.

**247 Special Libraries and Information Brokering (3).** *Daniel.* Characteristics of special libraries with emphasis on planning services to fit client needs, entrepreneurial activities, examination of public and private settings, and problems and issues surrounding the provision of specialized information services.

**251 Organization of Materials II (3).** *Saye. Prerequisite: INLS 151.* Examination of principles, practices, and future trends in the control and organization of materials. Instruction covers classification, subject indexing, and the cataloging of print and nonprint materials and online cataloging systems.

**254 Preservation of Library and Archive Materials (3).** *Greene.* An introduction to current practices, issues, and trends in the preservation of materials for libraries and archives with an emphasis on integrating preservation throughout an institution's operations.

**256 Database Systems I (3).** *Haas, Smith. Prerequisites: INLS 50 and INLS 162.* A study of the relational database model including entity-relationship theory, design, normalization techniques, and SQL.

**257 User Interface Design (3).** *Wildemuth. Prerequisite: INLS 162.* Basic principles for designing the human interface to information systems, emphasizing computer-assisted systems. Major topics: users' conceptual models of systems, human information processing capabilities, styles of interfaces, and evaluation methods.

**258 Database Systems II (3).** *Haas. Prerequisite: INLS 256.* Advanced study of database systems. Topics include database design, administration, current issues in development and use, object databases, and distributed databases.

**263 Knowledge-Based Systems (3).** *Haas, Solomon. Prerequisite: INLS 150.* Design of systems offering a knowledge base in support of task requirements or that model expertise. Knowledge acquisition and representation approaches will be applied in the systems development process.

**265 Abstracting and Indexing (3).** *Saye, Solomon. Prerequisite: INLS 50.* Presents the basic principles of subject analysis through the development and analysis of abstracts, indexes, and classification systems. Both natural language and controlled vocabulary indexing are covered.

**272 Artificial Intelligence for Information Retrieval (3).** *Losee. Prerequisite: INLS/COMP 172.* Logical and neural artificial intelligence models of documents, queries, and their relationship to document retrieval.

**283 Distributed Systems and Administration (3).** *Staff. Prerequisites: INLS 174 or INLS 181 or INLS 182).*
Distributed and client/server based computing. Includes operating system basics, security concerns, and issues and trends in network administration.

**299 Supervised Field Experience (3).** *Daquila. Prerequisites: completion of twenty-four semester hours and permission of adviser.* Supervised observation and practice in an information service agency or library. The student will work required amount of time in the work setting under the supervision of an information/library professional and will participate in faculty-led group discussions for ongoing evaluation of the practical experience.

**300 Study in Information and Library Science (1-3, repeatable).** *Members of the graduate faculty. Prerequisite: permission of the instructor.* Study by an individual student on a special topic under the direction of a specific faculty member.

**304 Seminar in Theory Development (3).** *Chatman. Prerequisites: doctoral or advanced master's student status.* Discussion and critique of the structural components and processes used in theory development. Seminar provides knowledge relating to the various stages of theory building.

**308 Seminar in Teaching and Academic Life (3).** *Daniel. Prerequisite: doctoral or advanced master's student status.* Examines teaching, research, publication, and service responsibilities. Provides perspective on professional graduate education and LIS educational programs. Explores changing curricula and discusses ethics, rewards, and problems of academic life.

**309 Seminar in Teaching Practice (1).** *Daniel. Pre- or corequisites: doctoral student status, INLS 308.* For doctoral students currently involved in teaching activities; regular seminar meetings to discuss relevant literature and aspects of the teaching experience.

**310 Advanced Selected Topics (1-6).** *Members of the graduate faculty.* Exploration of an advanced special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict

their future availability; new courses may replace these. Courses offered during the 1996-97 academic year:

**310(47) Database Systems II.** *Haas. (Now INLS 258)*
**310(48) The Virtual Library.** *Kilgour.*
**310(76) Seminar in Internet Policy and Future Initiatives.** *Dempsey.*

**311 Seminar in Information Services (3).** *Tibbo. Prerequisite: INLS 111 and pre- or corequisite: INLS 211.* Administrative and professional issues in the provision of reference and information services; includes policy development implementation, facilitation of communication, ethics, integration and implementation of information technologies, and management and evaluation of information services.

**315 Seminar in Information Policy in the Public Sector (3).** *Chatman. Prerequisite: permission of instructor.* Examination of client-centered services in libraries and information agencies. Includes: information as a commodity, public policy issues, and providers of information services.

**320 Seminar in Children's Literature (3).** *Staff. Prerequisite: INLS 123.* Advanced study of a selected topic relating to literature for children.

**326 Seminar in Popular Materials in Libraries (3).** *Moran.* Selected topics relating to the roles of various types of libraries in the provision and preservation of popular materials (light romances, science fiction, comic books, etc.) existing in various forms (print, recorded sound, etc.).

**341 Seminar in Public Libraries (3).** *Chatman, Gollop. Prerequisite: completion of twelve semester hours.* Selected topics in public library services, systems, networks, and their management. Current issues are emphasized, along with the interests of the participants.

**342 Seminar in Academic Libraries (3).** *Moran. Prerequisite: INLS 131.* Study of problems in the organization and administration of college and university libraries with emphasis upon current issues in personnel, finance, governance, and services.

**349 Seminar in Rare Book Collections (3).** *McNamara.* A study of the nature and importance of rare book collections; problems of acquisition, organization, and service.

**351 Administration of Technical Services (3).** *Saye.* Advanced study of the role and organization of technical services. Emphasis on management of acquisitions, serials and cataloging departments, coordination of technical services, and the impact of automation and networking.

**352 Seminar in the Organization of Information (3).** *Saye. Prerequisite: INLS 151.* Advanced study in the approaches used to organize information in libraries and information centers. Emphasizes both alphabetical and notational systems of subject indication.

**356 Systems Implementation (3).** *Staff. Prerequisites: INLS 162 and (INLS 256 or INLS 257).* Development and implementation of an information system by an individual student or team of students.

The final phases of the systems development life cycles will be discussed by the class.

**362 Systems Theory (3).** *Daniel. Prerequisite: INLS 162 or doctoral student status.* Applications of general systems theory in various arenas, such as biological systems, complex organizations and advanced systems analysis, and design techniques and tools.

**372 Seminar in Information Retrieval (3).** *Staff. Prerequisites: INLS 172 and doctoral student status.* A seminar on the basic questions that arise in information retrieval research and the methods and theories that enable observation, analysis, and interpretation.

**376 Seminar in Information (3).** *Losee. Prerequisite: advanced master's or doctoral standing.* Examines the idea of information as used by different disciplines and cultures at different historical periods.

**379 Research in Information Retrieval (1-6, repeatable).** *Staff. Prerequisites: INLS 372 and permission of instructor.* Supports individual and small-group research undertaken by doctoral students in information retrieval intended to produce research results of publishable quality.

**382 Seminar in Communication (3).** *Staff. Prerequisite: doctoral student status.* A seminar on the basic questions that arise in communication research and the methods and theories that enable observation, analysis, and interpretation.

**389 Research in Communication (1-6, repeatable).** *Staff. Prerequisites: INLS 382 and permission of instructor.* Supports individual and small group research undertaken by doctoral students in communication intended to produce research results of publishable quality.

**393 Master's Paper (0-3).** *Staff. Required of all master's students.*

**394 Doctoral Dissertation (3 or more).** *Staff.*

**399 Research in Information and Library Science (1-6, repeatable).** *Staff. Prerequisites: doctoral student status and permission of instructor.* Supports individual and small group research undertaken by doctoral students in information and library science intended to produce research results of publishable quality.

**400 General Registration (0).**

# SELECTED COURSES AVAILABLE IN OTHER DEPARTMENTS AT UNC-CH

## SCHOOL OF PUBLIC HEALTH

### Department of Biostatistics

**101 Fundamentals of Biostatistics (3).** (BIOS) Introduction to procedures in collection, summarization, analysis, and presentation of data. Topics include sampling, experimentation, measurement, descriptive statistics, probability, confidence intervals, and tests of hypotheses.

### Department of Epidemiology

**168 Fundamentals of Epidemiology (3).** (EPID) An intensive introduction to epidemiological concepts and methods for students intending to engage in, collaborate in, or interpret the results of epidemiologic studies. Some familiarity with biomedical concepts may be needed.

**220 Health Promotion/Disease Prevention and Behavioral Epidemiology (3).** (EPID) Selected topics on the role of lifestyle behavior in modern illness and on conceptual, methodologic, substantive, and policy issues in health promotion/disease prevention.

### Department of Health Behavior and Health Education

**130 Social and Behavioral Science Foundations of Health Education (var.).** (HBHE) Selected social and behavioral science theories and concepts that apply to the analysis of health related theories and concepts that apply to the analysis of health related behavior and to the generation of intervention strategies.

**172 Planning Health Promotion in Community, Worksite, School, and Medical Settings (4).** (HBHE) This course builds skills in developing components of health promotion programming in a variety of settings. It emphasizes use of needs and capacity assessments to identify focus of intervention; strategies for evaluating programs; application of health promotion models and program planning.

**212 Citizen Participation in Community Health Decision Making (1-4).** (HBHE) Theories and concepts of citizen participation in community health settings; a historical review of mandated citizen participation; and strategies for enhancing citizens' ability to influence the social policy process.

**225 Health Communication Theory and Research (3).** (HBHE) Overview of communication of theory and research and critical analysis of applications of communication of theory to health education and health behavior intervention.

**Department of Health Policy and Administration**

**101 Information Management in Health Policy and Administration (1).** (HPPA) Introduces students to methods for critically evaluating public health literature and using computers to identify, file, and retrieve information.

**107 Theory and Practice of Public Heath Policy and Administration (3).** (HPPA) Policy and management issues and ideals, including their historical derivations and international implications, in relation to current state and local practice.

**141 Marketing for Not-for-profit Organizations (3).** (HPPA) Application of basic principles of marketing and marketing decision models to problems in health care and other not-for-profit organizations.

**176 Introduction to Health Services Research (3).** (HPPA) Provides systematic introduction to selected methods for health services research, health services research literature, and research writing.

**180 Health Law (3).** (HPPA) The law and the legal decision-making processes and their relationship to the delivery of health services.

**185 Ethical Issues (3).** (HPPA) Nature of ethical thought and reasoning; contributions of religion and science; historical and current issues. Sections on professional practice issues and health policy issues.

**SCHOOL OF MEDICINE**

**Department of Biomedical Engineering, Medical Informatics Program**

**170 Introduction to Medical Informatics (3).** (BMME) A survey of current topics in medical informatics including: patient data collection and presenting, medical information storage and retrieval, hospital and medical information systems, medical records, CAI, and MD assistance programs.

**270 Research and Evaluation Methods in Medical Informatics (3).** (BMME) An introduction to the empirical literature of informatics and an intensive immersion into the design and execution of studies.

**271 Clinical Reasoning and Decision Making (3).** (BMME) Clinical reasoning and decision making under uncertainty are examined normatively and psychologically. Topics include: probability, Bayes' theorem, decision analysis, utility theories, and cognitive reasoning processes in decision making.

## SCHOOL OF EDUCATION

### Department of Curriculum and Instruction

**208 Curriculum in Higher Education (3).** (EDCI) Discussion of the major philosophies of curriculum, as applied to higher education; development of considerations appropriate in curriculum planning; examination of existing curricular programs.

**209 Curriculum Theory (3).** (EDCI) An advanced course that relates curriculum development to relevant theories and research in humanistic and behavioral studies.

**210 Instructional Theories (3).** (EDCI) Examines the nature and application of various theories of instruction to instructional goals, individual differences, teaching strategies, sequencing, motivation, and assessment.

**211 Instructional Systems Development (3).** (EDCI) Delineates strategies for developing instructional systems, including needs assessment, job analysis, goal setting, use of criterion tests, delivery systems, project management, and evaluation of learners and programs.

## KENAN-FLAGLER BUSINESS SCHOOL

**250 Human Behavior in Management (3).** The analysis of individual and group behavior in organizations and applications to organizational relations.

**254 Organizational Development (3).** Methods for changing and developing individuals, groups, and organizations. Analysis of different individual therapy techniques; group growth techniques such as T-groups and encounter groups organization design strategy.

**257 Personnel Administration (3).** A study of the factors contributing to the building and maintaining of an effective workforce.

**260 Marketing Management (3).** A course to develop an understanding of marketing problems and to survey policies and procedures for the formulation, execution, and appraisal of marketing programs.

**261 Marketing Research (3).** An examination of research methodology for marketing decision making. Emphasizes issues in research design, data collection, and the use of statistical analysis.

**291 Management of Not-for-Profit Organizations (3).** An analysis of the problems of managing not-for-profit organizations, including resource allocation, control, marketing, operations, professionalism, evaluation, and organization.

**354 Organizational Design and Development (3).** The development of understanding and skills in

changing and evolving organizational design, interpersonal relationships, and people, in order to achieve desired organizational goals.

**355 Methods in Organizational Behavior Research (3).** Research in organizational behavior with consideration of establishing experimental designs, data collection, and application of appropriate methods in the analysis of data.

## COLLEGE OF ARTS AND SCIENCES

### Department of Psychology

**253 Introduction to Community Psychological Approaches (3).** Survey of such topics as social contributions to psychopathology, comprehensive and integrated service delivery systems, consultation, primary prevention, manpower innovations, program evaluation, and epidemiological approaches.

**276 Quantitative Methods for Observing Behavior (3).** Techniques for collecting behavioral observations including the development of coding systems, reliability and validity, and interface with theory. Students design a study, collect and analyze data, and interpret results.

**277 Culture and Human Development (3).** Focus on how varied cultural conditions provide the social basis for human affective, social, and cognitive development. Integration of cross-cultural psychology and anthropology with developmental psychology.

### Selected medical informatics courses offered at Duke University

**205 Microprocessors and Digital Instruments (3).** Design of microcomputer-based devices including both hardware and software considerations of system design. Emphasis on hardware, including progression through initial design, prototype construction in the laboratory, and testing prototypes.

**241 Artificial Intelligence in Medicine (3).** Basic concepts of Artificial Intelligence (AI) and in-depth examination of medical applications of AI. Examination of search strategies, knowledge of heuristic programming, classic AI programming languages, and AI programming.

**243 Introduction to Medical Informatics (3).** Study of the use of computers in biomedical applications. Hardware, software, and applications programming. Data collection, analysis, and presentation studied within applications areas such as monitoring, medical record, computer-aided instruction.

**399 Special Readings: Medical Information and Computer Representation (3).** Examines methods used for representing medical knowledge in electronic machinable form. Introduction to approaches to codification of medical concepts and terminology.

## BUDGET REPORT (Unofficial)[1]

| Budget Code | Total |
|---|---|
| Personnel | $18,424 |
| Staff Benefits | 311 |
| Contracted Services | 35,217 |
| Supplies/Materials | 604 |
| Travel | 1,535 |
| Communication | 1,790 |
| Printing and Binding | 1,995 |
| Miscellaneous Services | 835 |
| Indirect Cost | 4,859 |
| **TOTAL** | $65,570 |

[1] Final figures are not yet available.